



SECOND QUARTER 2019 MONITORING REPORT
TEMPORARY APP PERMIT 106360
FLORENCE COPPER PROJECT, FLORENCE, ARIZONA

Florence Copper Inc.
1575 W. Hunt Highway
Florence, AZ 85132

July 29, 2019



FLORENCE COPPER INC.
1575 W. Hunt Highway, Florence, Arizona 85132 USA
florencecopper.com

July 29, 2019

Mr. Tracy Bunch
ADEQ Water Quality Compliance Section
Mail Code 5415B-1
1110 West Washington Street
Phoenix, Arizona 85007

Subject: Second Quarter 2019 Monitoring Report
Temporary Aquifer Protection Permit (APP) No. P-106360

Dear Mr. Bunch:

Florence Copper Inc. is regulated under Temporary APP No. P-106360, issued December 5, 2018 (LTF No. 61845) for a production test facility (PTF). The facility began active operations on December 15, 2018. This report outlines the reporting requirements in accordance with 2.7.4.4 – PTF Operations and Quarterly Monitoring Reports.

BACKGROUND INFORMATION

The Florence Copper project is an in-situ copper extraction facility subject to three related permits issued by the ADEQ and the United States Environmental Protection Agency (USEPA).

Sitewide Permits Covering the 1997-98 Pilot Test Facility and Future Operations

- ADEQ APP No. P-101704 (LTF 65804) dated October 13, 2017.

Under the Sitewide permits, a test wellfield, a small leachate processing facility, and a double-lined evaporation pond were constructed. The pilot test operated from October 31, 1997 to February 9, 1998. The test area was rinsed until September 1, 2004. Cessation of hydraulic control for testing was approved by both agencies and the wellfield has since remained inactive. Subsequently, no Sitewide permit-related activities have taken place.

The Sitewide facilities and monitoring wells are indicated in blue on Figure 1. Documentation required by Sitewide APP P-101704 is submitted under a separate cover. Some information may pertain to overlapping requirements of the permits.

2018-19 Production Test Facility

- ADEQ Temporary APP No. P-106360 (LTF 71099) dated December 5, 2018
- USEPA Underground Injection Control Permit (UIC) No. R9UIC-AZ3FY11-1 dated December 20, 2016

The permits authorize a new PTF with separate monitoring requirements inside the area of the Sitewide permit. Information gathered by the new PTF will be used to modify the Sitewide APP for future sitewide activity. The Temporary APP facilities and monitoring wells are indicated in green on Figure 1. A detail of the PTF wellfield is provided on Figure 2.

PTF OPERATIONS QUARTERLY REPORTING

Section 2.7.4.4.1 – Graphical Representation of Injected and Extracted Volumes

This information is provided in table and graph form in Attachment 1. The extracted volume has consistently exceeded the injected volume.

Section 2.7.4.4.2 – Graphical Representation of the Hydraulic Gradient in the PTF

This information is provided in table and graph form in Attachment 2. The hydraulic gradient has been maintained with a greater than 1-foot differential as a daily average.

Section 2.7.4.4.3 – Monthly Potentiometric Surface Maps of the PTF

The maps are provided in Attachment 3. The oxide groundwater elevation contours consistently show a groundwater gradient towards the PTF wellfield during the monitoring period.

Section 2.7.4.4.4 – LBFU Bulk Electrical Conductivity Contour Maps

This information is provided in Attachment 4. There were no exceedances of the bulk electrical conductivity alert levels (ALs).

Section 2.7.4.4.5 – Summary of Pressure Transducer and Fracture Gradient Readings

This information is provided in Attachment 5. There were no significant findings.

Section 2.7.4.4.6 – Graphical Representation of Fluid Electroconductivity Readings from Injection and Observations Wells

This information is provided in Attachment 6. There were no significant findings.

Section 2.7.4.4.7 – Description of Deviations from Standard Sampling Protocols

Groundwater monitoring of the point-of-compliance (POC) and best available demonstrated control technology (BADCT) monitoring wells was performed during the quarter. Routine monitoring of electrical conductivity for the PTF wells was also performed. There were no deviations from standard sampling protocols.

Section 2.7.4.4.8 – Summary of all Exceedances of ALs, AQLs, Action Levels, Discharge Limits or Operating Limits

There were no exceedances of an operational action level or discharge limit.

Groundwater monitoring of the POC and BADCT monitoring wells was performed in April and May of the Second Quarter 2019. The results were compared to the ALs and aquifer quality limits (AQLs) of the December 5, 2018 APP. There were no exceedances of a Temporary APP AL or AQL.

It should be noted that there were two potential exceedances of UIC established ALs for pH and gross beta discussed below.

Section 2.7.4.4.9 – Time versus Concentration Plots of Select Groundwater Parameters

This information is provided in Attachment 7. Potential trends are discussed under Groundwater Sampling Results below. Please note that historical outliers have been eliminated from the graphs for visual representation, but are maintained in the data set.

Section 2.7.4.4.10 – Area Groundwater Elevation Contour Maps

This map is provided in Attachment 8. The local irrigation wells did not appear to be active during the measurements of water levels, but operated routinely. The facility was active during the measurements collected for the quarter.

Section 2.7.4.4.11 – Discharge Characterization of the Underground Workings

Discharge characterization sampling of the underground workings was not required during the quarter. The initial discharge characterization sample was submitted as part of the Pre-Operational Report dated September 19, 2018. The next discharge characterization is required after at least 6 months of the operational phase.

Section 2.7.4.4.12 – Fissure Inspection Summary

Routine visual observations found no cracks or fissures in or around the PTF.

Section 2.7.4.4.13 – Table of Monitor Well Details and Water Levels

These tables are provided in Attachment 9.

Section 2.7.4.4.14 – Summary of all Monitor Wells Replaced

No monitoring wells were replaced during the quarter. Well M57R-O is intended to replace well M57-O; and is in ambient monitoring.

Section 2.7.4.4.15 – Groundwater Sampling Results for POC and BADCT Wells

Groundwater monitoring of the POC and BADCT monitoring wells was performed in April and May of the Second Quarter 2019. The results were compared to the ALs and AQLs of the December 5, 2018 APP. There were no exceedances of a Temporary APP AL or AQL.

A summary report of POC Quarterly Compliance Monitoring is included as Attachment 10. The report summarizes the results of Temporary APP and UIC groundwater monitoring activities and includes tables of the field parameters, analytical results for the quarterly monitoring parameters, and possible trends.

It should be noted that two exceedances of UIC established AL/AQLs for monitoring well M59-O were reported for pH and gross beta discussed in further detail in Attachment 10. Verification sampling was performed on July 19, 2019 and the field pH was below the AL, indicating that the exceedance was not confirmed. Samples were submitted to verify the gross beta exceedance, which will be reported in the Third Quarter 2019. The USEPA was notified of the results on July 19, 2019 with additional information to be provided as available.

Section 2.7.1 – Self-Monitoring Report Forms (SMRFs) for POC Wells

The completed self-monitoring report forms (SMRFs) for the Quarter will be submitted to the on-line MyDEQ portal.

Table 4.1-8 – Well Bore Annular Electrical Conductivity

This information is provided in Attachment 11. No significant changes were observed.

Section 2.7.4.4.16 – Copies of Reports Submitted to the USEPA for the UIC Permit

A copy of the quarterly monitoring report submitted to the USEPA for R9UIC-AZ3FY11-1 is being submitted under a separate cover.

Mr. Tracy Bunch
Arizona Department of Environmental Quality
July 29, 2019
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Please let us know if you require any further documentation. Please call me at (520) 374-3984 Ext. 3710 should you have any questions or concerns.

Sincerely,

Florence Copper Inc.

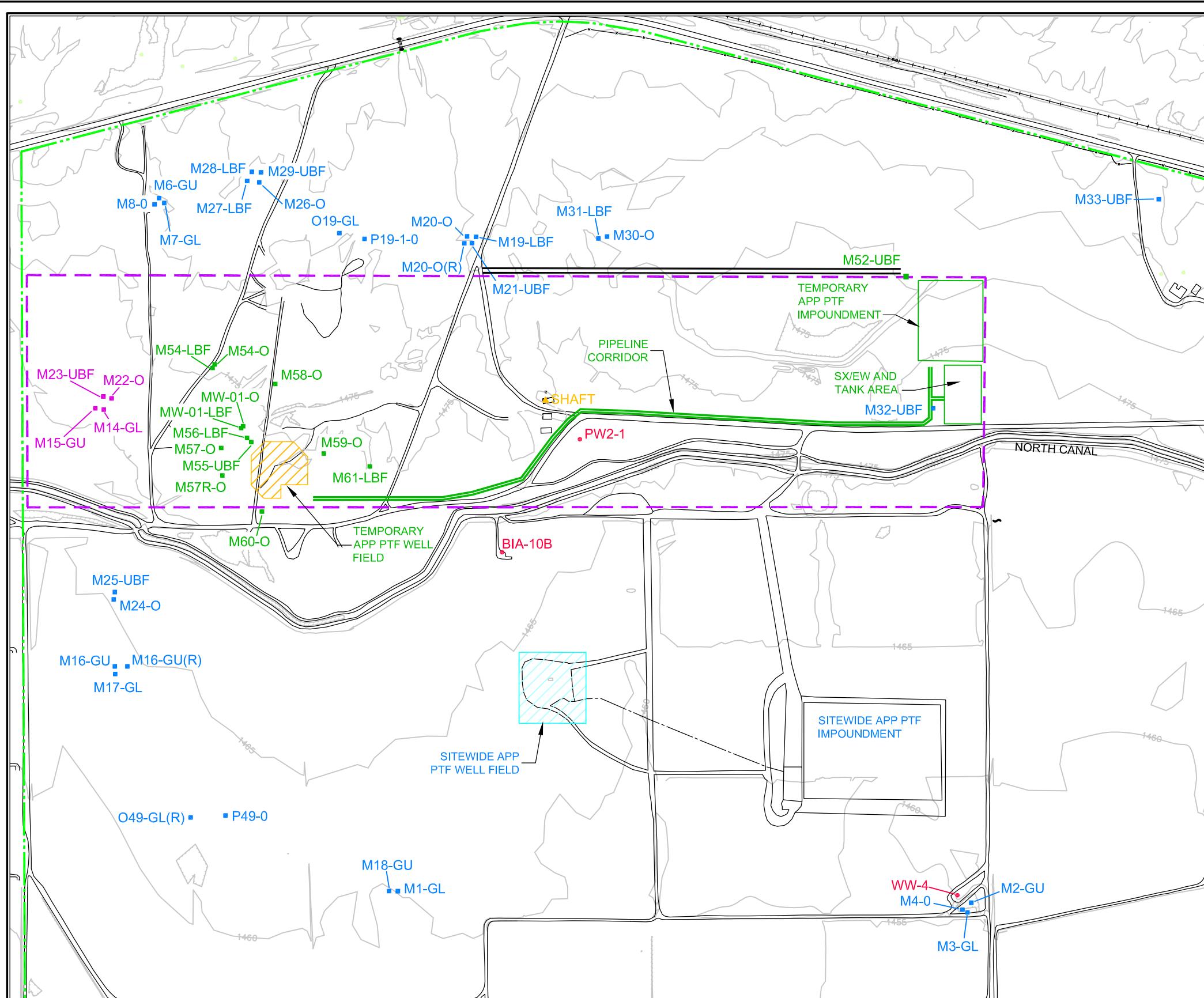


Daniel Johnson
Vice President/General Manager

BAS:cr

cc: Maribeth Greenslade, ADEQ

Attachments



EXPLANATION

- APPROXIMATE PROPERTY BOUNDARY
- STATE LEASE LAND BOUNDARY
- PIPELINE CORRIDOR
- M3-GL SITEWIDE APP MONITORING WELL
- M54-O TEMPORARY APP MONITORING WELL
- M14-GL DUAL PERMIT MONITORING WELL
- WW-4 PRODUCTION WELL
- SHAFT SHAFT TO UNDERGROUND WORKINGS

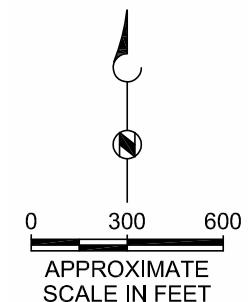
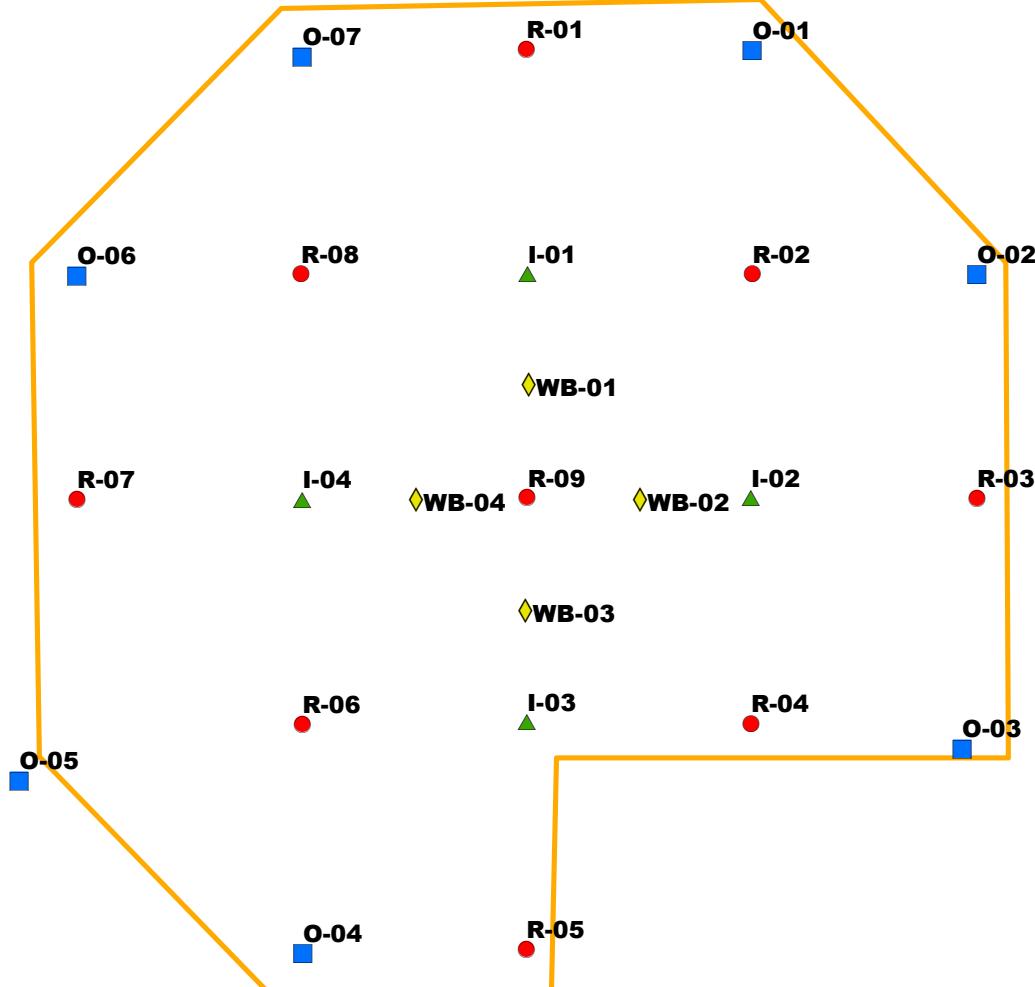


Figure 1
MONITORING AREA
FLORENCE COPPER PROJECT
FLORENCE, ARIZONA



LEGEND

- ▲ INJECTION WELL
- OBSERVATION WELL
- RECOVERY WELL
- ◆ WESTBAY WELL
- PTF WELLFIELD

NOTES

1. ALL LOCATIONS AND
DIMENSIONS APPROXIMATE



0 30 60
SCALE IN FEET

HALEY
ALDRICH

PRODUCTION TEST FACILITY
FLORENCE COPPER INC.
FLORENCE ARIZONA

PTF WELLFIELD

FLORENCE
COPPER

JANUARY 2019

ATTACHMENT 1

Injection and Extraction Volumes

Daily Injection and Extraction Volumes with Percent Recovery

Date	Daily Injection Volume (gallons)	Daily Recovery Volume (gallons)	Ratio PLS/Raff	% Recovery
4/1/2019	311,000	340,700	1.10	110
4/2/2019	312,500	342,900	1.10	110
4/3/2019	313,300	345,300	1.10	110
4/4/2019	315,600	359,200	1.14	114
4/5/2019	312,900	348,800	1.11	111
4/6/2019	314,400	348,400	1.11	111
4/7/2019	314,600	349,700	1.11	111
4/8/2019	309,300	362,100	1.17	117
4/9/2019	313,500	345,000	1.10	110
4/10/2019	294,700	329,600	1.12	112
4/11/2019	311,200	345,100	1.11	111
4/12/2019	311,300	344,800	1.11	111
4/13/2019	314,600	346,500	1.10	110
4/14/2019	311,400	345,100	1.11	111
4/15/2019	311,200	346,600	1.11	111
4/16/2019	312,100	344,100	1.10	110
4/17/2019	311,800	346,600	1.11	111
4/18/2019	334,300	366,900	1.10	110
4/19/2019	337,600	370,100	1.10	110
4/20/2019	338,300	373,600	1.10	110
4/21/2019	338,700	374,800	1.11	111
4/22/2019	317,500	353,700	1.11	111
4/23/2019	335,900	376,400	1.12	112
4/24/2019	338,200	375,000	1.11	111
4/25/2019	341,200	375,200	1.10	110
4/26/2019	337,900	374,400	1.11	111
4/27/2019	337,900	374,800	1.11	111
4/28/2019	338,700	374,400	1.11	111
4/29/2019	338,700	373,400	1.10	110
4/30/2019	339,500	375,100	1.10	110
April Averages	322,327	357,610	1.11	111

Daily Injection and Extraction Volumes with Percent Recovery

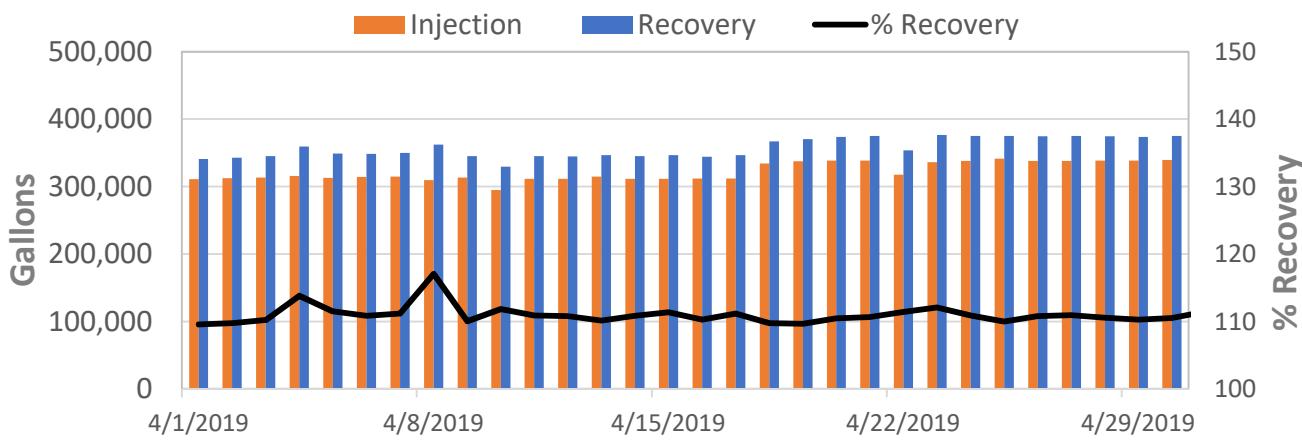
Date	Daily Injection Volume (gallons)	Daily Recovery Volume (gallons)	Ratio PLS/Raff	% Recovery
5/1/2019	338,800	377,600	1.11	111
5/2/2019	331,000	377,500	1.14	114
5/3/2019	335,700	376,300	1.12	112
5/4/2019	333,400	375,600	1.13	113
5/5/2019	334,400	376,200	1.13	113
5/6/2019	334,400	376,200	1.13	113
5/7/2019	336,200	380,200	1.13	113
5/8/2019	339,000	375,900	1.11	111
5/9/2019	338,600	377,000	1.11	111
5/10/2019	316,900	353,300	1.11	111
5/11/2019	280,400	314,500	1.12	112
5/12/2019	318,400	354,900	1.11	111
5/13/2019	344,000	382,900	1.11	111
5/14/2019	308,700	350,200	1.13	113
5/15/2019	338,700	377,300	1.11	111
5/16/2019	321,500	359,500	1.12	112
5/17/2019	337,100	377,000	1.12	112
5/18/2019	334,500	374,800	1.12	112
5/19/2019	335,300	375,900	1.12	112
5/20/2019	328,900	377,400	1.15	115
5/21/2019	321,400	371,900	1.16	116
5/22/2019	318,400	366,300	1.15	115
5/23/2019	332,900	375,200	1.13	113
5/24/2019	336,900	374,500	1.11	111
5/25/2019	338,600	374,700	1.11	111
5/26/2019	338,800	374,800	1.11	111
5/27/2019	335,400	377,300	1.12	112
5/28/2019	332,800	374,600	1.13	113
5/29/2019	73,600	185,900	2.53	253
5/30/2019	91,900	188,900	2.06	206
5/31/2019	77,400	178,900	2.31	231
May Averages	305,935	352,684	1.24	124

Daily Injection and Extraction Volumes with Percent Recovery

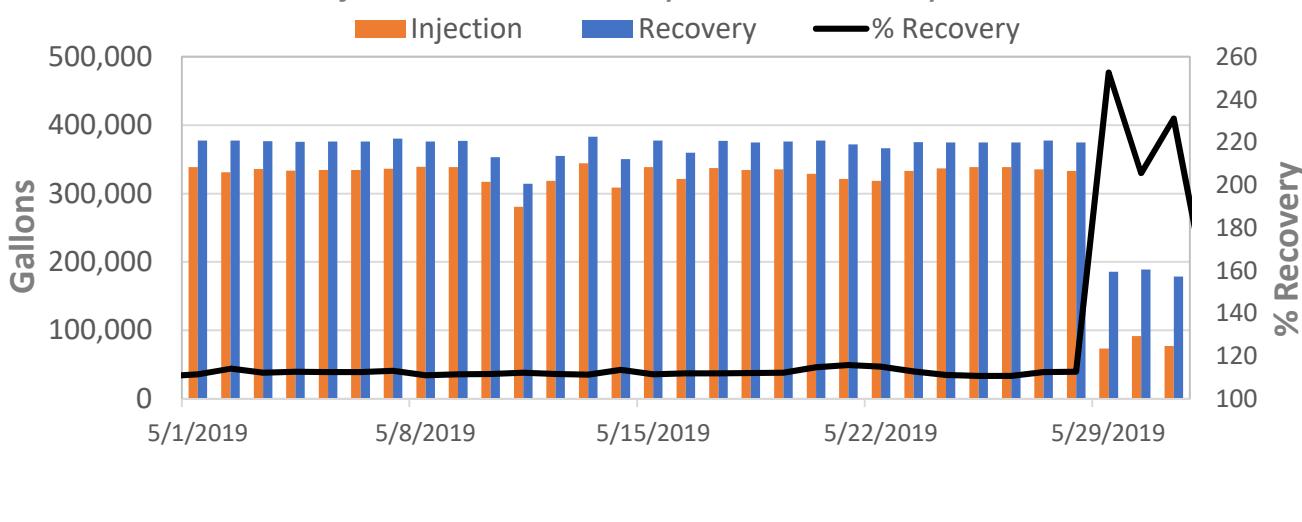
Date	Daily Injection Volume (gallons)	Daily Recovery Volume (gallons)	Ratio PLS/Raff	% Recovery
6/1/2019	145,200	222,100	1.53	153
6/2/2019	172,500	243,800	1.41	141
6/3/2019	173,200	248,400	1.43	143
6/4/2019	186,100	283,100	1.52	152
6/5/2019	206,600	294,700	1.43	143
6/6/2019	217,900	314,100	1.44	144
6/7/2019	232,000	317,200	1.37	137
6/8/2019	229,500	306,100	1.33	133
6/9/2019	228,100	310,200	1.36	136
6/10/2019	226,900	313,600	1.38	138
6/11/2019	278,000	349,300	1.26	126
6/12/2019	338,800	372,700	1.10	110
6/13/2019	340,100	380,000	1.12	112
6/14/2019	338,700	378,700	1.12	112
6/15/2019	338,600	378,800	1.12	112
6/16/2019	338,600	379,200	1.12	112
6/17/2019	338,600	379,100	1.12	112
6/18/2019	335,900	378,000	1.13	113
6/19/2019	338,000	378,600	1.12	112
6/20/2019	338,600	379,000	1.12	112
6/21/2019	339,700	378,900	1.12	112
6/22/2019	339,800	376,300	1.11	111
6/23/2019	337,800	376,500	1.11	111
6/24/2019	339,000	378,100	1.12	112
6/25/2019	339,000	383,400	1.13	113
6/26/2019	324,100	371,300	1.15	115
6/27/2019	338,800	381,000	1.12	112
6/28/2019	339,000	376,800	1.11	111
6/29/2019	338,700	377,900	1.12	112
6/30/2019	340,700	380,300	1.12	112
June Averages	290,617	346,240	1.22	122.41

Center recovery well R-09 was off from 5/29 to 6/11 for reconditioning of the well screen due to gypsum precipitant. During that time, flows and water elevations were closely monitored to maintain hydraulic gradient. Initially the recovery well/injection well flow ratio was increased to 2.5:1. To conserve water, this ratio was gradually decreased while still maintaining hydraulic control until R-09 was brought back on line on 6/11.

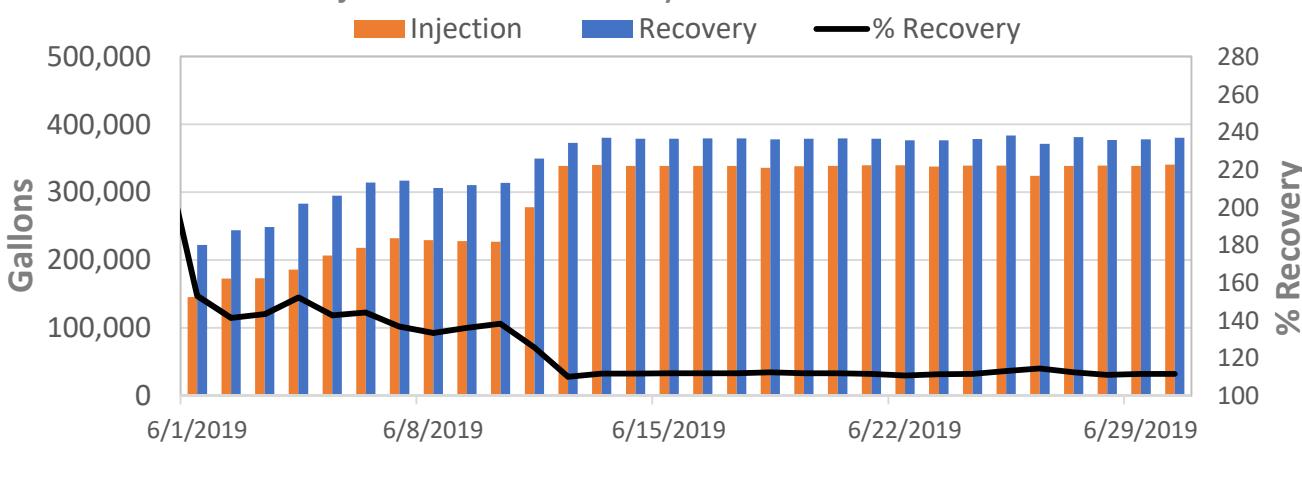
Injection vs. Recovery Volumes - April



Injection vs. Recovery Volumes - May



Injection vs. Recovery Volumes - June



ATTACHMENT 2

Hydraulic Gradient in the PTF

Hydraulic Gradient - Daily Average Water Level Elevations - Observation and Recovery Wells

Date	R-01	O-01	O-07	R-02	O-01	O-02	R-03	O-02	O-03	R-04	O-03
04/01/19	1,233.47	1,235.77	1,235.57	1,225.10	1,235.77	1,235.94	1,228.34	1,235.94	1,236.57	1,232.07	1,236.57
04/02/19	1,233.32	1,235.53	1,235.41	1,230.01	1,235.53	1,235.80	1,228.35	1,235.80	1,236.61	1,232.55	1,236.61
04/03/19	1,232.85	1,235.32	1,235.37	1,229.53	1,235.32	1,235.61	1,228.14	1,235.61	1,236.39	1,231.95	1,236.39
04/04/19	1,233.24	1,235.90	1,235.91	1,231.18	1,235.90	1,236.35	1,227.97	1,236.35	1,236.98	1,232.46	1,236.98
04/05/19	1,232.61	1,235.09	1,235.18	1,229.33	1,235.09	1,235.67	1,228.28	1,235.67	1,236.59	1,232.10	1,236.59
04/06/19	1,233.85	1,236.17	1,236.36	1,230.07	1,236.17	1,236.61	1,228.54	1,236.61	1,237.56	1,232.98	1,237.56
04/07/19	1,235.20	1,239.33	1,238.14	#N/A	1,239.33	1,239.59	1,227.93	1,239.59	1,238.33	1,233.92	1,238.33
04/08/19	1,235.30	1,240.89	1,239.04	#N/A	1,240.89	1,240.94	1,227.11	1,240.94	1,239.15	1,236.36	1,239.15
04/09/19	1,236.65	1,240.31	1,239.60	1,231.61	1,240.31	1,240.40	1,230.38	1,240.40	1,240.31	1,237.62	1,240.31
04/10/19	1,238.26	1,240.18	1,240.18	1,231.93	1,240.18	1,240.19	1,230.37	1,240.19	1,240.06	#N/A	1,240.06
04/11/19	1,238.31	1,240.37	1,240.41	1,231.56	1,240.37	1,240.37	1,233.78	1,240.37	1,239.71	1,224.94	1,239.71
04/12/19	1,238.17	1,240.70	1,240.45	1,232.07	1,240.70	1,241.02	1,234.32	1,241.02	1,240.52	1,224.72	1,240.52
04/13/19	1,238.95	1,241.00	1,240.84	1,232.45	1,241.00	1,241.13	1,234.83	1,241.13	1,240.77	1,225.37	1,240.77
04/14/19	1,238.61	1,240.36	1,240.35	1,229.88	1,240.36	1,240.43	1,234.53	1,240.43	1,239.88	1,224.78	1,239.88
04/15/19	1,237.11	1,240.29	1,239.69	1,227.69	1,240.29	1,239.80	1,231.78	1,239.80	1,238.14	1,222.52	1,238.14
04/16/19	1,236.57	1,239.86	1,239.39	1,226.35	1,239.86	1,239.23	1,231.47	1,239.23	1,237.67	1,224.24	1,237.67
04/17/19	1,238.01	1,240.50	1,239.67	1,227.88	1,240.50	1,239.69	1,232.93	1,239.69	1,237.22	1,220.99	1,237.22
04/18/19	1,237.09	1,240.31	1,239.73	1,225.03	1,240.31	1,239.67	1,233.92	1,239.67	1,238.14	1,223.36	1,238.14
04/19/19	1,235.81	1,240.10	1,239.60	1,224.69	1,240.10	1,239.67	1,235.26	1,239.67	1,238.61	1,222.43	1,238.61
04/20/19	1,233.90	1,239.28	1,238.72	1,224.08	1,239.28	1,239.24	1,235.67	1,239.24	1,239.11	1,224.31	1,239.11
04/21/19	1,232.37	1,237.74	1,237.15	1,222.46	1,237.74	1,237.70	1,234.31	1,237.70	1,237.34	1,221.05	1,237.34
04/22/19	1,232.09	1,237.69	1,236.90	1,222.26	1,237.69	1,237.62	1,234.22	1,237.62	1,237.44	1,222.36	1,237.44
04/23/19	1,230.08	1,236.20	1,235.37	1,222.66	1,236.20	1,236.14	1,232.33	1,236.14	1,235.51	1,218.35	1,235.51
04/24/19	1,226.96	1,235.87	1,235.68	1,216.54	1,235.87	1,235.67	1,228.11	1,235.67	1,235.60	1,218.68	1,235.60
04/25/19	1,227.59	1,235.36	1,235.14	1,218.32	1,235.36	1,235.20	1,229.46	1,235.20	1,235.03	1,217.43	1,235.03
04/26/19	1,227.73	1,233.66	1,233.70	1,215.20	1,233.66	1,233.88	1,231.23	1,233.88	1,234.93	1,221.75	1,234.93
04/27/19	1,226.76	1,233.13	1,233.24	1,213.53	1,233.13	1,233.49	1,231.10	1,233.49	1,234.72	1,222.16	1,234.72
04/28/19	1,226.78	1,233.16	1,233.35	1,211.98	1,233.16	1,233.53	1,231.53	1,233.53	1,234.88	1,222.07	1,234.88
04/29/19	1,227.20	1,234.07	1,234.19	1,214.10	1,234.07	1,234.41	1,231.63	1,234.41	1,235.61	1,222.13	1,235.61
04/30/19	1,227.52	1,234.09	1,234.24	1,212.60	1,234.09	1,234.46	1,232.08	1,234.46	1,236.04	1,222.34	1,236.04
05/01/19	1,227.78	1,234.53	1,234.58	1,212.34	1,234.53	1,234.87	1,232.15	1,234.87	1,236.34	1,222.36	1,236.34
05/02/19	1,230.04	1,236.80	1,236.73	1,216.73	1,236.80	1,236.82	1,230.86	1,236.82	1,237.59	1,222.79	1,237.59
05/03/19	1,231.22	1,237.93	1,238.12	1,215.71	1,237.93	1,238.06	1,230.00	1,238.06	1,240.25	1,231.16	1,240.25
05/04/19	1,232.12	1,238.63	1,238.73	1,215.72	1,238.63	1,238.73	1,230.79	1,238.73	1,240.59	1,224.21	1,240.59
05/05/19	1,232.25	1,239.17	1,239.11	1,220.07	1,239.17	1,239.21	1,232.91	1,239.21	1,239.95	1,222.54	1,239.95
05/06/19	1,233.14	1,239.20	1,239.28	1,219.22	1,239.20	1,239.41	1,235.04	1,239.41	1,240.33	1,219.95	1,240.33
05/07/19	1,235.97	1,238.56	1,239.38	1,213.74	1,238.56	1,238.55	1,235.40	1,238.55	1,238.87	1,210.02	1,238.87
05/08/19	1,235.79	1,238.20	1,239.42	1,214.52	1,238.20	1,238.90	1,235.10	1,238.90	1,240.74	1,225.81	1,240.74
05/09/19	1,237.06	1,238.99	1,240.06	1,213.55	1,238.99	1,239.34	1,235.91	1,239.34	1,239.51	1,213.60	1,239.51
05/10/19	1,236.35	1,240.42	1,240.87	1,218.74	1,240.42	1,241.13	1,234.98	1,241.13	1,242.95	1,236.10	1,242.95
05/11/19	1,236.70	1,240.20	1,241.45	1,217.07	1,240.20	1,240.89	1,237.39	1,240.89	1,242.91	1,230.14	1,242.91
05/12/19	1,237.25	1,240.40	1,241.16	1,223.52	1,240.40	1,240.69	1,234.42	1,240.69	1,240.34	1,215.28	1,240.34
05/13/19	1,233.55	1,238.33	1,238.73	1,221.31	1,238.33	1,238.34	1,230.79	1,238.34	1,237.43	1,209.90	1,237.43
05/14/19	1,234.16	1,239.40	1,238.73	1,230.40	1,239.40	1,240.13	1,234.88	1,240.13	1,240.76	1,225.70	1,240.76
05/15/19	1,235.87	1,239.59	1,239.91	1,223.04	1,239.59	1,239.92	1,233.87	1,239.92	1,240.31	1,214.36	1,240.31

Hydraulic Gradient - Daily Average Water Level Elevations - Observation and Recovery Wells

Date	R-05	O-04	R-06	O-04	O-05	R-07	O-05	O-06	R-08	O-06	O-07
04/01/19	1,233.14	1,235.31	1,229.44	1,235.31	1,235.09	1,232.51	1,235.09	1,234.36	1,228.69	1,234.36	1,235.57
04/02/19	1,233.52	1,235.84	1,229.82	1,235.84	1,235.13	1,232.65	1,235.13	1,234.63	1,227.86	1,234.63	1,235.41
04/03/19	1,232.88	1,235.77	1,228.78	1,235.77	1,235.13	1,232.69	1,235.13	1,234.68	1,225.50	1,234.68	1,235.37
04/04/19	1,233.26	1,236.18	1,228.59	1,236.18	1,235.47	1,232.87	1,235.47	1,235.09	1,225.95	1,235.09	1,235.91
04/05/19	1,233.12	1,235.80	1,228.40	1,235.80	1,235.01	1,232.38	1,235.01	1,234.40	1,223.48	1,234.40	1,235.18
04/06/19	1,234.08	1,237.05	1,230.22	1,237.05	1,236.27	1,233.57	1,236.27	1,235.62	1,225.69	1,235.62	1,236.36
04/07/19	1,229.15	1,237.75	1,228.49	1,237.75	1,237.42	1,235.17	1,237.42	1,237.03	1,224.06	1,237.03	1,238.14
04/08/19	1,227.72	1,238.28	1,228.27	1,238.28	1,237.93	1,235.33	1,237.93	1,237.71	1,225.45	1,237.71	1,239.04
04/09/19	1,233.70	1,239.61	1,230.32	1,239.61	1,239.07	1,236.53	1,239.07	1,238.63	1,227.74	1,238.63	1,239.60
04/10/19	1,230.44	1,239.70	1,229.21	1,239.70	1,239.33	1,236.46	1,239.33	1,239.04	#N/A	1,239.04	1,240.18
04/11/19	1,233.83	1,240.15	1,228.89	1,240.15	1,239.66	1,236.71	1,239.66	1,239.27	1,230.64	1,239.27	1,240.41
04/12/19	1,233.49	1,240.32	1,228.64	1,240.32	1,239.75	1,236.74	1,239.75	1,239.26	1,230.29	1,239.26	1,240.45
04/13/19	1,235.07	1,240.62	1,228.27	1,240.62	1,239.98	1,236.94	1,239.98	1,239.53	1,230.31	1,239.53	1,240.84
04/14/19	1,234.77	1,240.26	1,227.92	1,240.26	1,239.68	1,236.61	1,239.68	1,239.14	1,230.05	1,239.14	1,240.35
04/15/19	1,232.38	1,238.70	1,226.10	1,238.70	1,238.62	1,235.95	1,238.62	1,238.47	1,226.74	1,238.47	1,239.69
04/16/19	1,231.97	1,238.25	1,226.30	1,238.25	1,238.33	1,235.94	1,238.33	1,238.21	1,226.39	1,238.21	1,239.39
04/17/19	1,233.29	1,238.48	1,226.69	1,238.48	1,238.72	1,236.46	1,238.72	1,238.58	1,227.04	1,238.58	1,239.67
04/18/19	1,233.96	1,238.93	1,226.80	1,238.93	1,238.01	1,236.05	1,238.01	1,238.76	1,230.85	1,238.76	1,239.73
04/19/19	1,235.75	1,239.11	1,227.49	1,239.11	1,237.47	1,235.97	1,237.47	1,238.91	1,234.39	1,238.91	1,239.60
04/20/19	1,236.29	1,238.77	1,229.54	1,238.77	1,236.94	1,235.29	1,236.94	1,238.04	1,231.38	1,238.04	1,238.72
04/21/19	1,234.83	1,237.07	1,227.62	1,237.07	1,235.28	1,233.49	1,235.28	1,236.41	1,228.85	1,236.41	1,237.15
04/22/19	1,234.52	1,236.70	1,226.95	1,236.70	1,234.96	1,233.16	1,234.96	1,236.20	1,228.86	1,236.20	1,236.90
04/23/19	1,232.72	1,235.20	1,225.68	1,235.20	1,233.48	1,231.57	1,233.48	1,234.62	1,226.04	1,234.62	1,235.37
04/24/19	1,228.97	1,235.32	1,222.32	1,235.32	1,233.67	1,231.75	1,233.67	1,235.02	1,225.18	1,235.02	1,235.68
04/25/19	1,230.11	1,234.69	1,220.60	1,234.69	1,233.13	1,231.38	1,233.13	1,234.51	1,227.33	1,234.51	1,235.14
04/26/19	1,231.75	1,233.70	1,219.26	1,233.70	1,231.85	1,230.09	1,231.85	1,232.95	1,224.97	1,232.95	1,233.70
04/27/19	1,231.73	1,233.41	1,218.73	1,233.41	1,231.47	1,229.71	1,231.47	1,232.51	1,224.17	1,232.51	1,233.24
04/28/19	1,232.03	1,233.58	1,218.60	1,233.58	1,231.62	1,229.81	1,231.62	1,232.59	1,224.01	1,232.59	1,233.35
04/29/19	1,232.73	1,234.35	1,218.76	1,234.35	1,232.37	1,230.55	1,232.37	1,233.46	1,225.92	1,233.46	1,234.19
04/30/19	1,232.80	1,234.61	1,222.01	1,234.61	1,232.56	1,230.68	1,232.56	1,233.50	1,224.75	1,233.50	1,234.24
05/01/19	1,232.31	1,234.84	1,220.40	1,234.84	1,232.79	1,230.87	1,232.79	1,233.80	1,224.49	1,233.80	1,234.58
05/02/19	1,231.43	1,236.71	1,222.37	1,236.71	1,234.82	1,232.92	1,234.82	1,235.94	1,226.39	1,235.94	1,236.73
05/03/19	1,230.97	1,238.18	1,222.84	1,238.18	1,236.30	1,234.47	1,236.30	1,237.51	1,230.99	1,237.51	1,238.12
05/04/19	1,233.52	1,239.00	1,223.61	1,239.00	1,237.06	1,235.14	1,237.06	1,238.19	1,230.35	1,238.19	1,238.73
05/05/19	1,234.60	1,239.22	1,223.15	1,239.22	1,237.31	1,235.42	1,237.31	1,238.48	1,231.27	1,238.48	1,239.11
05/06/19	1,236.23	1,239.78	1,226.52	1,239.78	1,237.81	1,236.00	1,237.81	1,238.65	1,229.58	1,238.65	1,239.28
05/07/19	1,235.23	1,239.89	1,228.72	1,239.89	1,238.13	1,236.60	1,238.13	1,238.93	1,228.45	1,238.93	1,236.60
05/08/19	1,237.10	1,240.51	1,229.87	1,240.51	1,240.04	1,237.11	1,240.04	1,238.61	1,222.97	1,238.61	1,239.42
05/09/19	1,237.15	1,240.64	1,229.71	1,240.64	1,240.38	1,237.49	1,240.38	1,239.06	1,222.30	1,239.06	1,240.06
05/10/19	1,238.68	1,241.40	1,227.16	1,241.40	1,241.00	1,238.14	1,241.00	1,239.77	1,222.75	1,239.77	1,240.87
05/11/19	1,240.40	1,242.03	1,226.08	1,242.03	1,241.51	1,238.66	1,241.51	1,240.53	1,227.12	1,240.53	1,241.45
05/12/19	1,239.09	1,241.02	1,225.65	1,241.02	1,240.86	1,238.11	1,240.86	1,240.02	1,224.53	1,240.02	1,241.16
05/13/19	1,231.36	1,238.22	1,221.03	1,238.22	1,238.34	1,235.71	1,238.34	1,237.59	1,224.38	1,237.59	1,238.73
05/14/19	1,233.26	1,238.91	1,224.42	1,238.91	1,238.52	1,235.65	1,238.52	1,237.33	1,220.91	1,237.33	1,238.73
05/15/19	1,233.11	1,240.00	1,223.91	1,240.00	1,239.82	1,237.06	1,239.82	1,238.70	1,222.12	1,238.70	1,239.91

Hydraulic Gradient - Daily Average Water Level Elevations - Observation and Recovery Wells

Date	R-01	O-01	O-07	R-02	O-01	O-02	R-03	O-02	O-03	R-04	O-03
05/16/19	1,236.95	1,240.08	1,240.41	1,225.50	1,240.08	1,240.20	1,233.30	1,240.20	1,240.44	1,217.28	1,240.44
05/17/19	1,235.78	1,240.28	1,240.63	1,222.59	1,240.28	1,240.63	1,233.89	1,240.63	1,241.15	1,213.81	1,241.15
05/18/19	1,235.86	1,240.33	1,240.65	1,222.20	1,240.33	1,240.70	1,232.97	1,240.70	1,241.44	1,219.07	1,241.44
05/19/19	1,235.05	1,240.02	1,240.29	1,225.72	1,240.02	1,240.23	1,230.97	1,240.23	1,240.11	1,212.45	1,240.11
05/20/19	1,233.37	1,239.15	1,239.87	1,222.15	1,239.15	1,239.16	1,227.44	1,239.16	1,239.20	1,213.95	1,239.20
05/21/19	1,233.68	1,239.00	1,239.20	1,221.53	1,239.00	1,238.96	1,228.23	1,238.96	1,240.64	1,212.84	1,240.64
05/22/19	1,234.35	1,239.11	1,239.26	1,223.70	1,239.11	1,238.97	1,227.20	1,238.97	1,239.96	1,209.43	1,239.96
05/23/19	1,234.75	1,239.41	1,239.62	1,224.36	1,239.41	1,239.59	1,232.16	1,239.59	1,241.75	1,215.39	1,241.75
05/24/19	1,234.81	1,241.27	1,240.91	1,227.39	1,241.27	1,241.14	1,227.42	1,241.14	1,242.21	1,212.12	1,242.21
05/25/19	1,234.80	1,241.10	1,240.70	1,227.52	1,241.10	1,241.05	1,227.70	1,241.05	1,242.33	1,211.12	1,242.33
05/26/19	1,236.00	1,239.87	1,239.93	1,226.17	1,239.87	1,239.94	1,230.90	1,239.94	1,241.76	1,209.77	1,241.76
05/27/19	1,234.80	1,241.10	1,240.70	1,227.49	1,241.10	1,241.05	1,227.70	1,241.05	1,242.33	1,211.12	1,242.33
05/28/19	1,234.14	1,239.42	1,239.61	1,222.83	1,239.42	1,239.64	1,231.94	1,239.64	1,241.87	1,212.86	1,241.87
05/29/19	1,230.25	1,232.33	1,233.93	1,223.55	1,232.33	1,232.54	1,224.68	1,232.54	1,233.17	1,222.26	1,233.17
05/30/19	1,228.06	1,232.01	1,233.43	1,222.15	1,232.01	1,232.01	1,224.91	1,232.01	1,233.06	1,223.41	1,233.06
05/31/19	1,231.17	1,234.20	1,235.47	1,223.83	1,234.20	1,234.21	1,227.19	1,234.21	1,235.66	1,225.58	1,235.66
06/01/19	1,233.32	1,236.36	1,237.50	1,223.45	1,236.36	1,235.97	1,223.27	1,235.97	1,236.64	1,225.20	1,236.64
06/02/19	1,237.47	1,239.65	1,240.62	1,222.73	1,239.65	1,238.81	1,222.84	1,238.81	1,238.90	1,226.62	1,238.90
06/03/19	1,236.83	1,239.88	1,240.98	1,222.57	1,239.88	1,239.17	1,222.69	1,239.17	1,239.32	1,226.09	1,239.32
06/04/19	1,233.63	1,238.41	1,239.82	1,220.76	1,238.41	1,237.66	1,220.90	1,237.66	1,236.94	1,214.15	1,236.94
06/05/19	1,233.90	1,238.86	1,240.29	1,221.01	1,238.86	1,238.12	1,221.66	1,238.12	1,237.52	1,213.01	1,237.52
06/06/19	1,231.30	1,238.13	1,239.70	1,217.85	1,238.13	1,237.25	1,220.36	1,237.25	1,236.12	1,206.37	1,236.12
06/07/19	1,231.98	1,238.92	1,240.24	1,216.99	1,238.92	1,237.93	1,221.02	1,237.93	1,236.88	1,206.08	1,236.88
06/08/19	1,235.37	1,239.72	1,240.86	1,217.38	1,239.72	1,238.53	1,221.41	1,238.53	1,237.23	1,205.76	1,237.23
06/09/19	1,234.55	1,239.56	1,240.74	1,217.00	1,239.56	1,238.45	1,221.24	1,238.45	1,237.08	1,205.14	1,237.08
06/10/19	1,230.31	1,237.38	1,238.65	1,218.68	1,237.38	1,236.91	1,219.34	1,236.91	1,237.37	1,209.95	1,237.37
06/11/19	1,231.30	1,237.03	1,237.90	1,218.98	1,237.03	1,236.79	1,223.24	1,236.79	1,238.08	1,209.41	1,238.08
06/12/19	1,231.71	1,240.52	1,240.41	1,227.04	1,240.52	1,241.13	1,226.06	1,241.13	1,241.69	1,217.31	1,241.69
06/13/19	1,232.13	1,240.90	1,240.74	1,227.14	1,240.90	1,241.45	1,224.89	1,241.45	1,241.51	1,216.46	1,241.51
06/14/19	1,231.98	1,241.48	1,241.23	1,227.62	1,241.48	1,242.08	1,225.67	1,242.08	1,242.38	1,218.92	1,242.38
06/15/19	1,232.81	1,241.63	1,241.40	1,227.31	1,241.63	1,242.22	1,225.65	1,242.22	1,242.29	1,217.87	1,242.29
06/16/19	1,231.58	1,240.39	1,240.11	1,226.03	1,240.39	1,240.99	1,224.16	1,240.99	1,240.91	1,216.04	1,240.91
06/17/19	1,230.79	1,239.48	1,239.17	1,224.88	1,239.48	1,240.10	1,223.41	1,240.10	1,240.10	1,214.75	1,240.10
06/18/19	1,229.87	1,239.06	1,238.70	1,224.35	1,239.06	1,239.76	1,224.60	1,239.76	1,239.86	1,216.42	1,239.86
06/19/19	1,229.91	1,238.66	1,238.26	1,223.70	1,238.66	1,239.21	1,222.20	1,239.21	1,239.10	1,213.53	1,239.10
06/20/19	1,228.51	1,237.78	1,237.42	1,222.63	1,237.78	1,238.30	1,221.14	1,238.30	1,238.19	1,212.14	1,238.19
06/21/19	1,227.67	1,236.32	1,236.29	1,221.02	1,236.32	1,237.08	1,219.98	1,237.08	1,237.61	1,211.24	1,237.61
06/22/19	1,227.07	1,235.77	1,235.43	1,219.85	1,235.77	1,236.13	1,218.02	1,236.13	1,235.88	1,208.53	1,235.88
06/23/19	1,225.73	1,234.96	1,234.53	1,222.02	1,234.96	1,235.37	1,217.21	1,235.37	1,234.94	1,207.32	1,234.94
06/24/19	1,225.45	1,233.80	1,233.57	1,219.06	1,233.80	1,234.05	1,215.00	1,234.05	1,233.59	1,205.07	1,233.59
06/25/19	1,223.55	1,232.92	1,232.64	1,218.19	1,232.92	1,233.17	1,214.22	1,233.17	1,232.49	1,206.35	1,232.49
06/26/19	1,224.37	1,233.21	1,233.02	1,218.14	1,233.21	1,233.32	1,214.33	1,233.32	1,232.39	1,203.64	1,232.39
06/27/19	1,224.94	1,234.42	1,234.01	1,219.25	1,234.42	1,234.56	1,215.99	1,234.56	1,233.77	1,205.16	1,233.77
06/28/19	1,226.79	1,235.80	1,235.28	1,220.45	1,235.80	1,235.94	1,217.19	1,235.94	1,235.26	1,206.22	1,235.26
06/29/19	1,227.37	1,236.99	1,236.55	1,221.61	1,236.99	1,237.22	1,218.60	1,237.22	1,236.68	1,207.21	1,236.68
06/30/19	1,228.62	1,237.18	1,236.86	1,220.77	1,237.18	1,237.30	1,217.17	1,237.30	1,236.63	1,205.69	1,236.63

All measurements in elevation above mean sea level.

#N/A or NM = Not measured or otherwise not available

No data were available for the following dates/wells:

4/7-4/8/19 R-02 pump and transducer pulled for diagnosis/repair.

4/10/19 R-04 and R-08 pump and transducer pulled for diagnostics/repair.

Hydraulic Gradient - Daily Average Water Level Elevations - Observation and Recovery Wells

Date	R-05	O-04	R-06	O-04	O-05	R-07	O-05	O-06	R-08	O-06	O-07
05/16/19	1,237.53	1,240.64	1,223.61	1,240.64	1,240.41	1,237.57	1,240.41	1,239.23	1,222.56	1,239.23	1,240.41
05/17/19	1,234.11	1,240.89	1,221.76	1,240.89	1,240.61	1,237.77	1,240.61	1,239.41	1,222.54	1,239.41	1,240.63
05/18/19	1,233.06	1,240.89	1,225.80	1,240.89	1,240.71	1,237.81	1,240.71	1,239.50	1,222.41	1,239.50	1,240.65
05/19/19	1,231.91	1,240.26	1,224.32	1,240.26	1,240.25	1,237.55	1,240.25	1,239.14	1,221.93	1,239.14	1,240.29
05/20/19	1,228.57	1,239.64	1,221.34	1,239.64	1,239.78	1,237.14	1,239.78	1,238.93	1,224.29	1,238.93	1,239.87
05/21/19	1,228.61	1,239.38	1,219.67	1,239.38	1,239.03	1,236.21	1,239.03	1,238.24	1,222.03	1,238.24	1,239.20
05/22/19	1,228.11	1,238.88	1,216.92	1,238.88	1,238.52	1,235.45	1,238.52	1,238.05	1,225.99	1,238.05	1,239.26
05/23/19	1,231.60	1,239.77	1,219.48	1,239.77	1,239.15	1,235.80	1,239.15	1,238.41	1,226.43	1,238.41	1,239.62
05/24/19	1,230.78	1,240.85	1,219.44	1,240.85	1,240.41	1,237.40	1,240.41	1,239.78	1,227.56	1,239.78	1,240.91
05/25/19	1,231.00	1,240.61	1,218.53	1,240.61	1,240.14	1,236.86	1,240.14	1,239.52	1,227.26	1,239.52	1,240.70
05/26/19	1,231.87	1,239.67	1,218.22	1,239.67	1,239.19	1,236.18	1,239.19	1,238.62	1,226.58	1,238.62	1,239.93
05/27/19	1,231.00	1,240.61	1,218.53	1,240.61	1,240.14	1,236.86	1,240.14	1,239.52	1,227.26	1,239.52	1,240.70
05/28/19	1,230.48	1,239.38	1,214.94	1,239.38	1,238.97	1,236.65	1,238.97	1,238.48	1,226.01	1,238.48	1,239.61
05/29/19	1,221.38	1,233.99	1,225.82	1,233.99	1,234.00	1,232.04	1,234.00	1,233.09	1,224.91	1,233.09	1,233.93
05/30/19	1,219.28	1,233.64	1,225.42	1,233.64	1,233.34	1,231.04	1,233.34	1,232.39	1,223.64	1,232.39	1,233.43
05/31/19	1,225.16	1,235.99	1,227.39	1,235.99	1,235.56	1,233.19	1,235.56	1,234.52	1,225.44	1,234.52	1,235.47
06/01/19	1,219.46	1,237.47	1,229.82	1,237.47	1,237.41	1,235.35	1,237.41	1,236.57	1,226.94	1,236.57	1,237.50
06/02/19	1,217.36	1,240.00	1,232.62	1,240.00	1,240.26	1,238.41	1,240.26	1,239.65	1,229.50	1,239.65	1,240.62
06/03/19	1,220.85	1,240.61	1,231.64	1,240.61	1,240.74	1,238.67	1,240.74	1,240.07	1,229.82	1,240.07	1,240.98
06/04/19	1,216.93	1,239.12	1,222.16	1,239.12	1,239.30	1,237.38	1,239.30	1,238.81	1,228.48	1,238.81	1,239.82
06/05/19	1,219.79	1,239.41	1,217.26	1,239.41	1,239.53	1,237.70	1,239.53	1,239.18	1,228.88	1,239.18	1,240.29
06/06/19	1,214.72	1,238.75	1,217.04	1,238.75	1,239.03	1,237.20	1,239.03	1,238.70	1,228.41	1,238.70	1,239.70
06/07/19	1,214.96	1,239.19	1,217.38	1,239.19	1,239.57	1,237.76	1,239.57	1,239.26	1,229.11	1,239.26	1,240.24
06/08/19	1,215.07	1,239.39	1,217.23	1,239.39	1,239.83	1,238.14	1,239.83	1,239.75	1,229.70	1,239.75	1,240.86
06/09/19	1,214.88	1,239.27	1,216.71	1,239.27	1,239.77	1,238.05	1,239.77	1,239.68	1,229.59	1,239.68	1,240.74
06/10/19	1,217.58	1,238.51	1,214.07	1,238.51	1,238.44	1,236.41	1,238.44	1,237.88	1,226.56	1,237.88	1,238.65
06/11/19	1,221.44	1,238.13	1,216.38	1,238.13	1,237.85	1,235.68	1,237.85	1,237.11	1,225.96	1,237.11	1,237.90
06/12/19	1,230.61	1,240.27	1,221.89	1,240.27	1,240.70	1,238.40	1,240.70	1,240.24	1,228.72	1,240.24	1,240.41
06/13/19	1,227.02	1,240.16	1,217.79	1,240.16	1,240.73	1,238.32	1,240.73	1,240.43	1,228.81	1,240.43	1,240.74
06/14/19	1,227.85	1,240.66	1,215.97	1,240.66	1,241.17	1,238.64	1,241.17	1,240.88	1,229.42	1,240.88	1,241.23
06/15/19	1,226.74	1,240.76	1,217.69	1,240.76	1,241.31	1,238.76	1,241.31	1,241.03	1,229.50	1,241.03	1,241.40
06/16/19	1,225.01	1,239.20	1,212.81	1,239.20	1,239.81	1,237.35	1,239.81	1,239.70	1,228.53	1,239.70	1,240.11
06/17/19	1,224.21	1,238.20	1,210.98	1,238.20	1,238.80	1,236.32	1,238.80	1,238.69	1,226.79	1,238.69	1,239.17
06/18/19	1,224.36	1,237.85	1,210.14	1,237.85	1,238.35	1,235.88	1,238.35	1,238.25	1,226.28	1,238.25	1,238.70
06/19/19	1,223.29	1,237.30	1,209.04	1,237.30	1,237.92	1,235.45	1,237.92	1,237.85	1,225.81	1,237.85	1,238.26
06/20/19	1,222.35	1,236.43	1,207.60	1,236.43	1,237.11	1,234.59	1,237.11	1,236.99	1,224.88	1,236.99	1,237.42
06/21/19	1,221.72	1,235.62	1,206.92	1,235.62	1,236.21	1,233.63	1,236.21	1,235.95	1,223.67	1,235.95	1,236.29
06/22/19	1,221.47	1,234.11	1,205.05	1,234.11	1,234.84	1,232.49	1,234.84	1,234.85	1,223.04	1,234.85	1,235.43
06/23/19	1,218.47	1,233.14	1,204.15	1,233.14	1,234.06	1,231.88	1,234.06	1,234.03	1,221.23	1,234.03	1,234.53
06/24/19	1,216.61	1,232.21	1,207.24	1,232.21	1,233.12	1,230.66	1,233.12	1,233.06	1,220.67	1,233.06	1,233.57
06/25/19	1,213.65	1,231.26	1,209.91	1,231.26	1,232.22	1,229.60	1,232.22	1,232.09	1,218.44	1,232.09	1,232.64
06/26/19	1,214.24	1,231.57	1,209.12	1,231.57	1,232.51	1,229.95	1,232.51	1,232.43	1,218.78	1,232.43	1,233.02
06/27/19	1,214.74	1,232.70	1,210.57	1,232.70	1,233.63	1,230.99	1,233.63	1,233.46	1,219.63	1,233.46	1,234.01
06/28/19	1,218.78	1,234.07	1,210.39	1,234.07	1,234.92	1,232.28	1,234.92	1,234.77	1,220.87	1,234.77	1,235.28
06/29/19	1,220.10	1,235.54	1,211.12	1,235.54	1,236.32	1,233.63	1,236.32	1,236.05	1,222.03	1,236.05	1,236.55
06/30/19	1,222.12	1,235.82	1,210.10	1,235.82	1,236.61	1,233.90	1,236.61	1,236.33	1,222.28	1,236.33	1,236.86

All measurements in elevation above mean sea level.

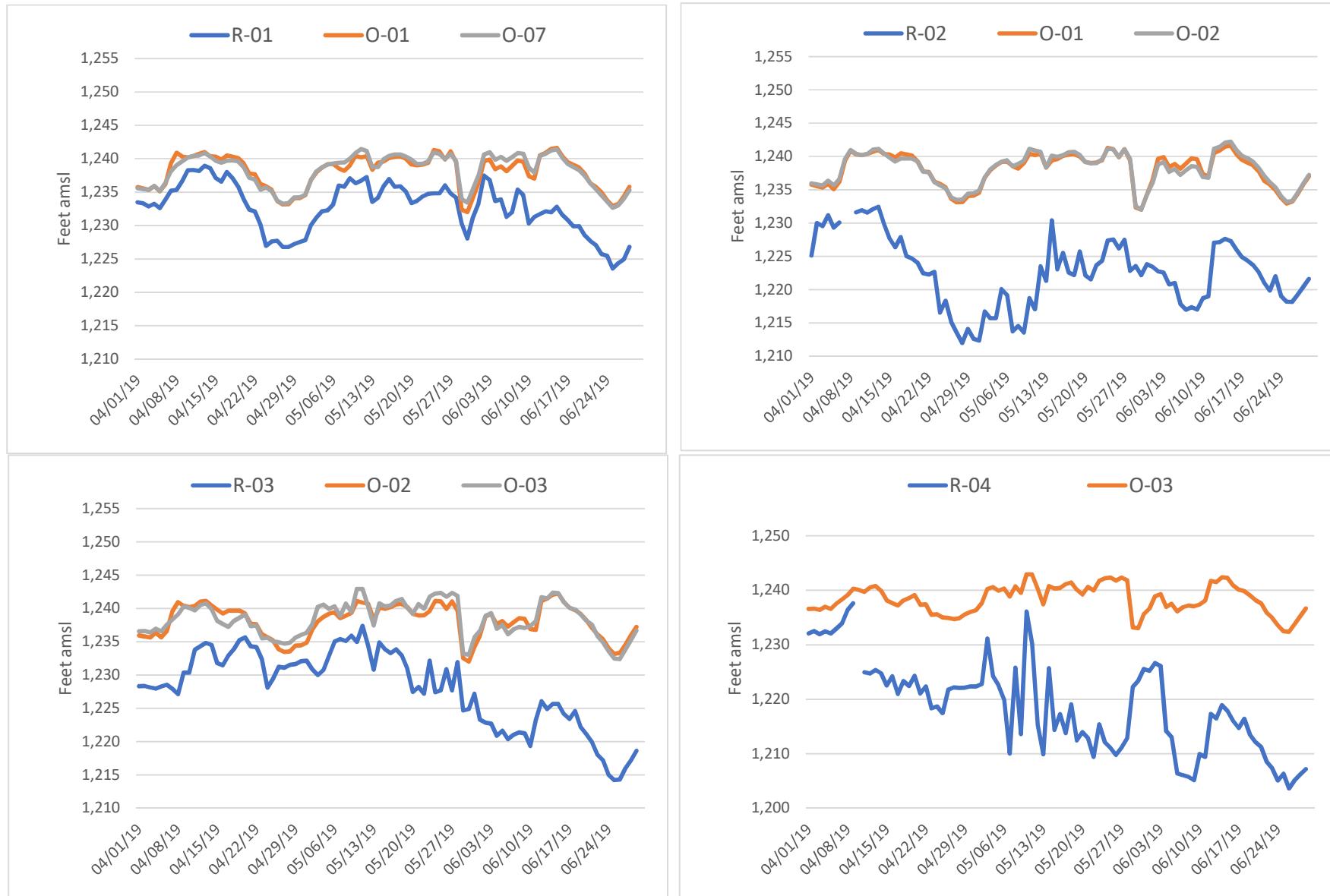
#N/A or NM = Not measured or otherwise not available

No data were available for the following dates/wells:

4/7-4/8/19 R-02 pump and transducer pulled for diagnosis/repair.

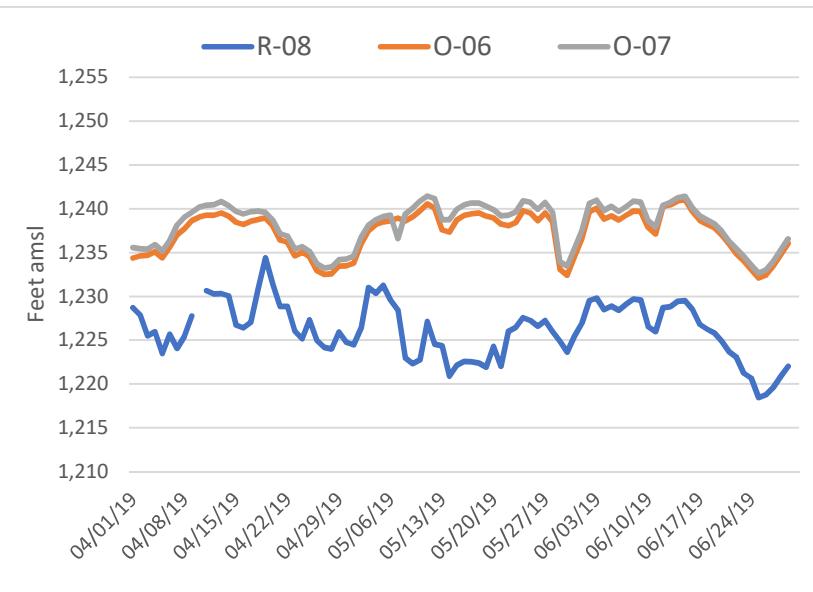
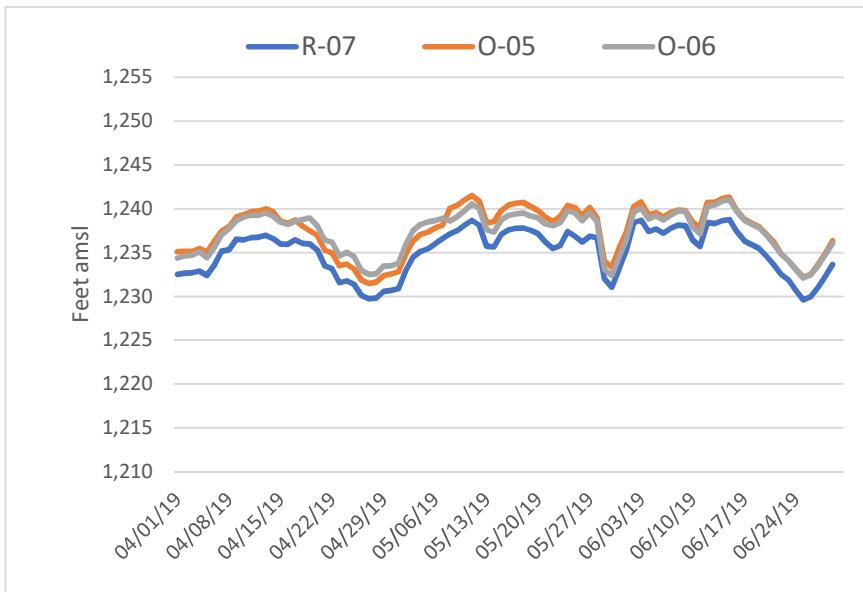
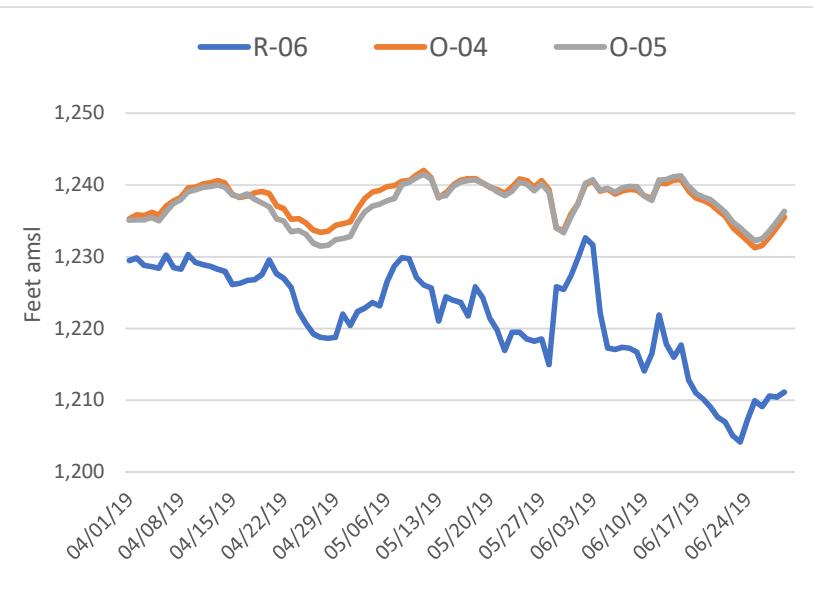
4/10/19 R-04 and R-08 pump and transducer pulled for diagnostics/repair.

Hydraulic Gradient - Daily Average Water Level Elevations - Observation and Recovery Wells



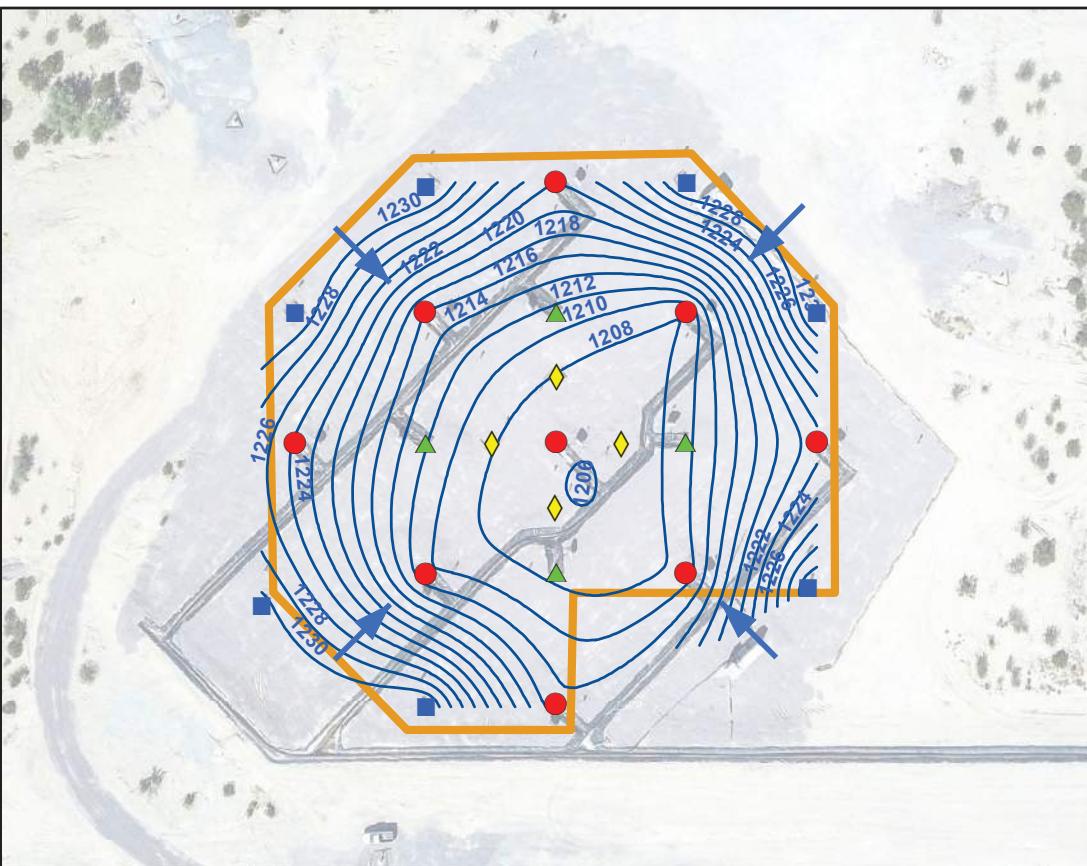
On 4/7/19 R-02 pump and transducer pulled for diagnosis/repair. On 4/10/19 R-04 and R-08 pump and transducer pulled for diagnostics/repair.

Hydraulic Gradient - Daily Average Water Level Elevations - Observation and Recovery Wells

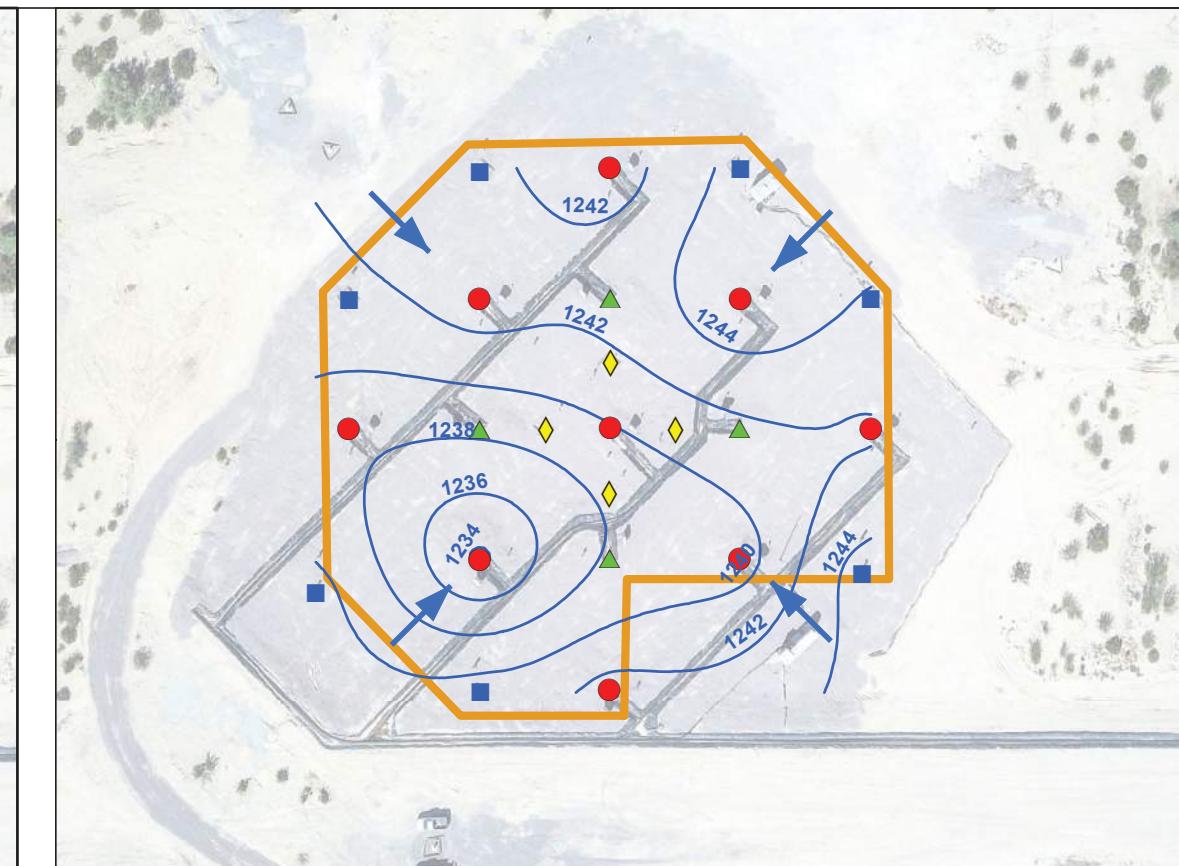


ATTACHMENT 3

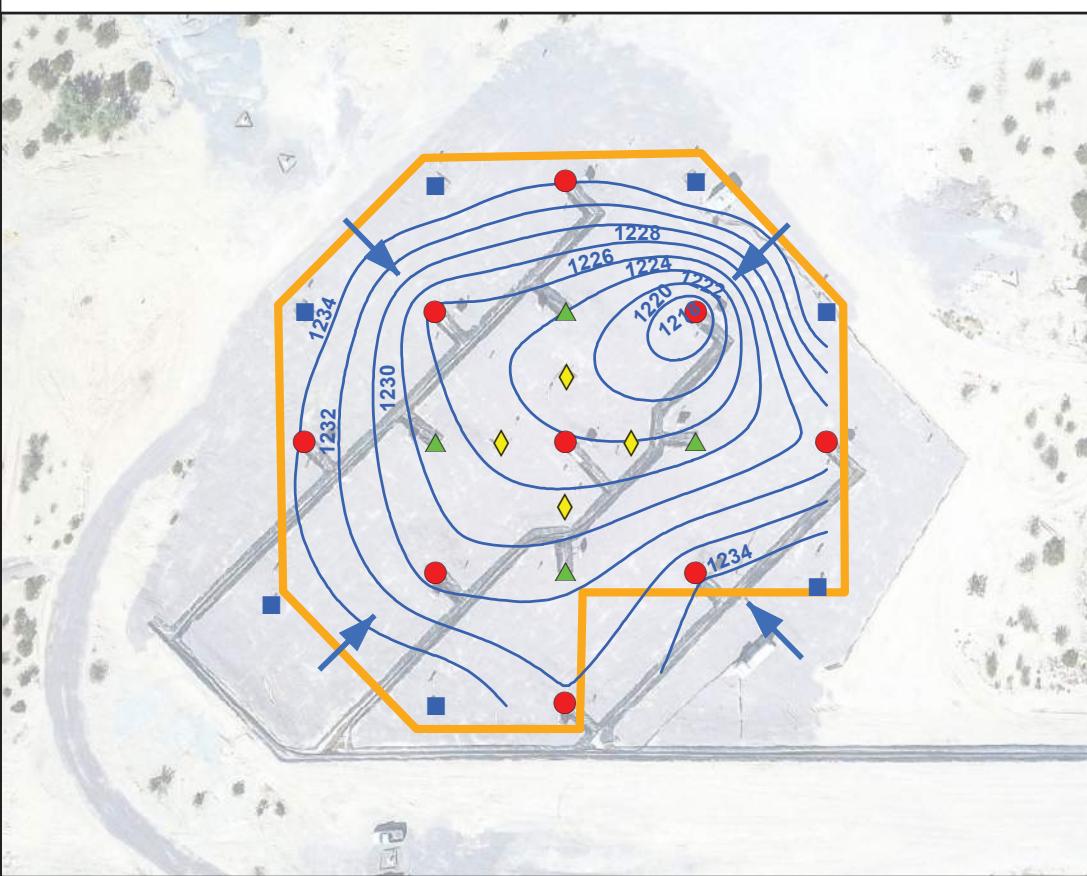
Monthly Potentiometric Surface Maps of the PTF



APRIL 2019 MINIMUM GROUNDWATER ELEVATIONS



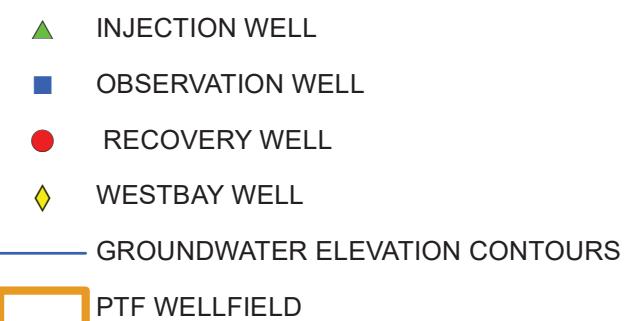
APRIL 2019 MAXIMUM GROUNDWATER ELEVATIONS



APRIL 2019 AVERAGE GROUNDWATER ELEVATIONS

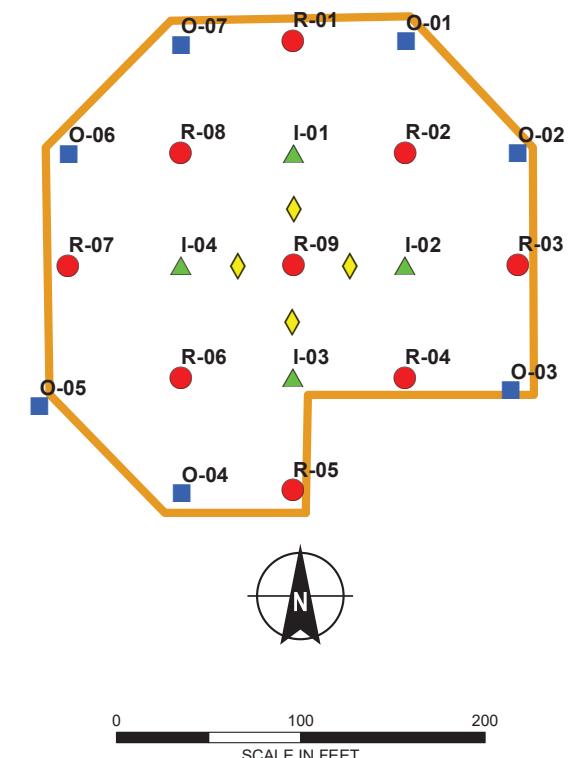
WELL ID	MINIMUM WLE (ft AMSL)	MINIMUM WLE DATE	MAXIMUM WLE (ft AMSL)	MAXIMUM WLE DATE	AVERAGE WLE (ft AMSL)
R-01	1221.93	04/05/19	1240.74	04/13/19	1234.16
R-02	1208.02	04/29/19	1246.06	04/08/19	1217.35
R-03	1221.10	04/27/19	1241.73	04/05/19	1228.38
R-04	1208.83	04/11/19	1239.01	04/09/19	1233.69
R-05	1212.61	04/30/19	1242.83	04/18/19	1232.12
R-06	1210.31	04/26/19	1233.51	04/09/19	1229.06
R-07	1223.71	04/08/19	1238.54	04/16/19	1233.79
R-08	1215.79	04/03/19	1245.58	04/23/19	1225.37
R-09	1198.27	04/21/19	1249.23	04/17/19	1238.29
O-01	1232.81	04/27/19	1244.62	04/17/19	1237.56
O-02	1233.05	04/30/19	1243.83	04/17/19	1237.56
O-03	1231.74	04/26/19	1245.02	04/20/19	1237.47
O-04	1232.48	04/27/19	1240.90	04/09/19	1237.09
O-05	1230.85	04/27/19	1240.76	04/09/19	1236.08
O-06	1232.32	04/27/19	1241.56	04/19/19	1236.38
O-07	1233.05	04/27/19	1242.37	04/16/19	1237.23

*GROUNDWATER CONTOURS GENERATED USING OUTER RECOVERY AND OBSERVATION WELLS



NOTES

1. ALL LOCATIONS AND DIMENSIONS APPROXIMATE
2. GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL
3. CONTOUR INTERVAL = 2 FEET
4. WLE = WATER LEVEL ELEVATION



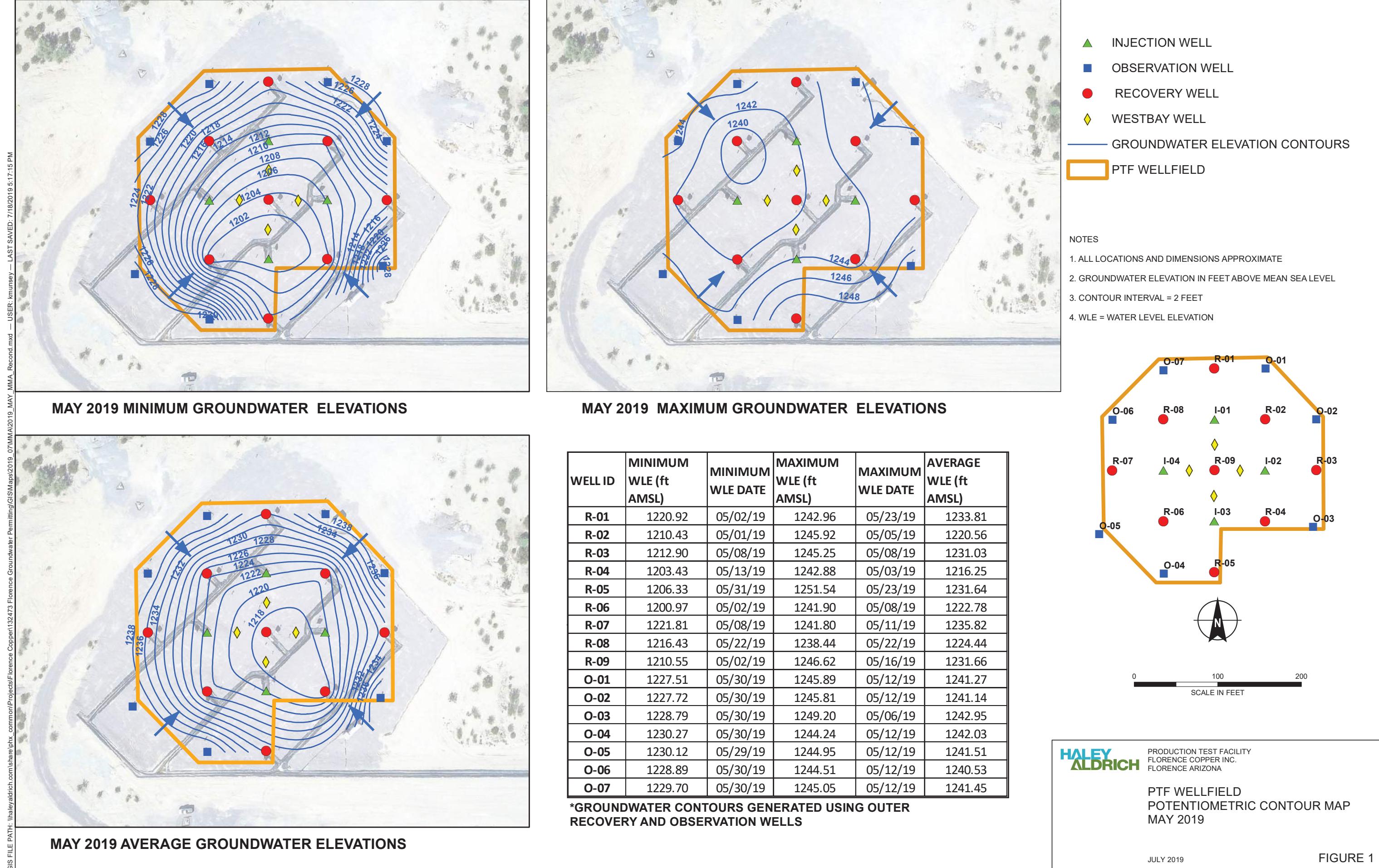
HALEY
ALDRICH

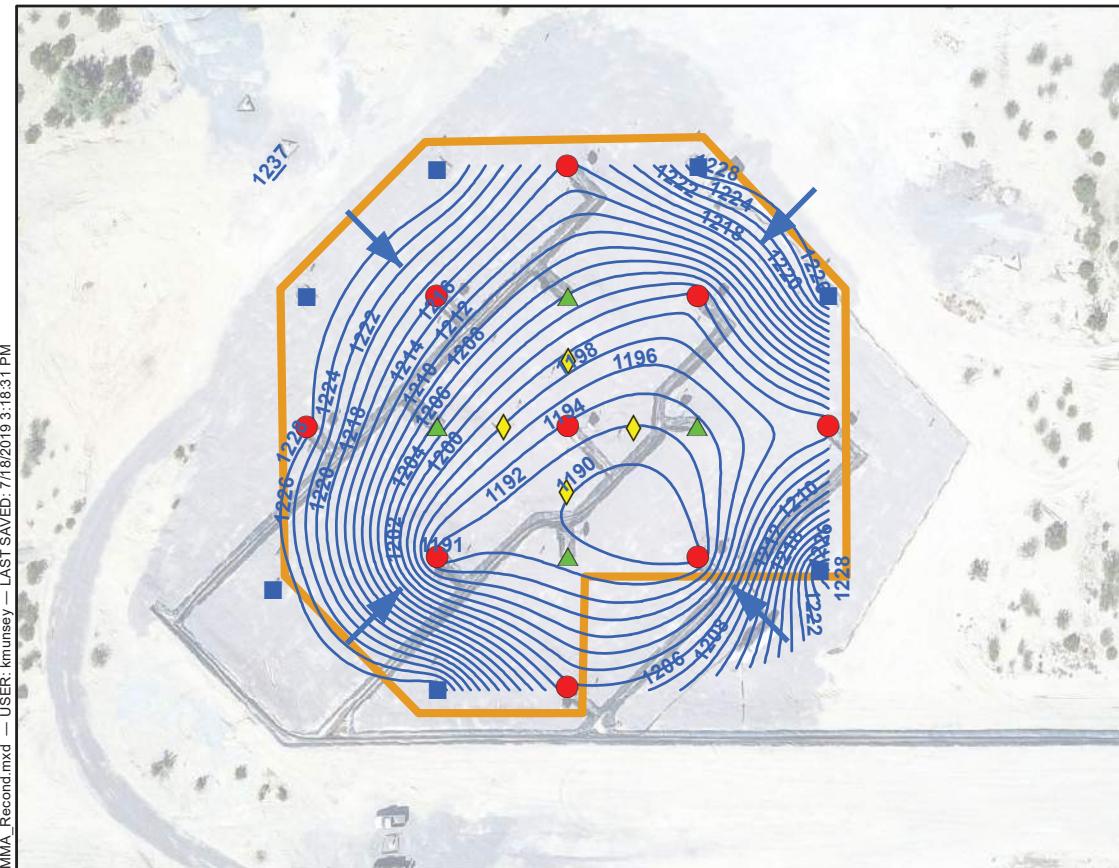
PRODUCTION TEST FACILITY
FLORENCE COPPER INC.
FLORENCE ARIZONA

PTF WELLFIELD
POTENTIOMETRIC CONTOUR MAP
APRIL 2019

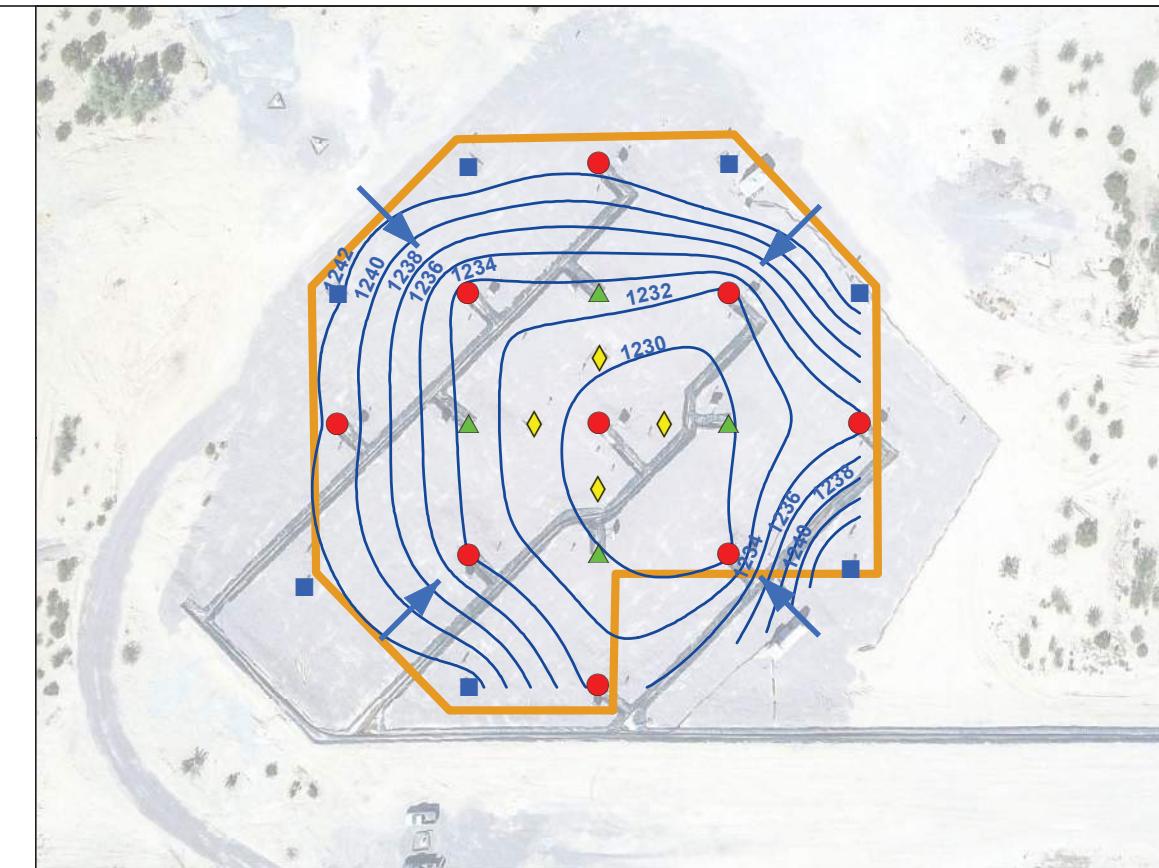
JULY 2019

FIGURE 1

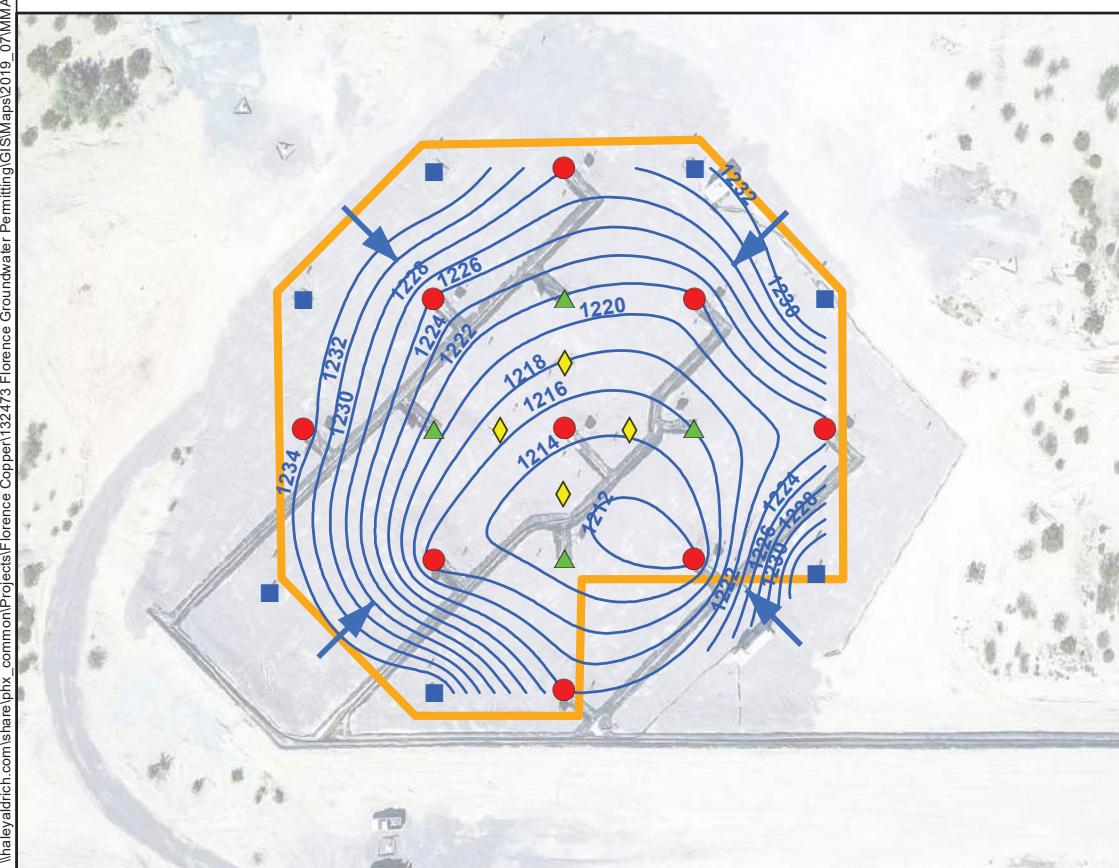




JUNE 2019 MINIMUM GROUNDWATER ELEVATIONS



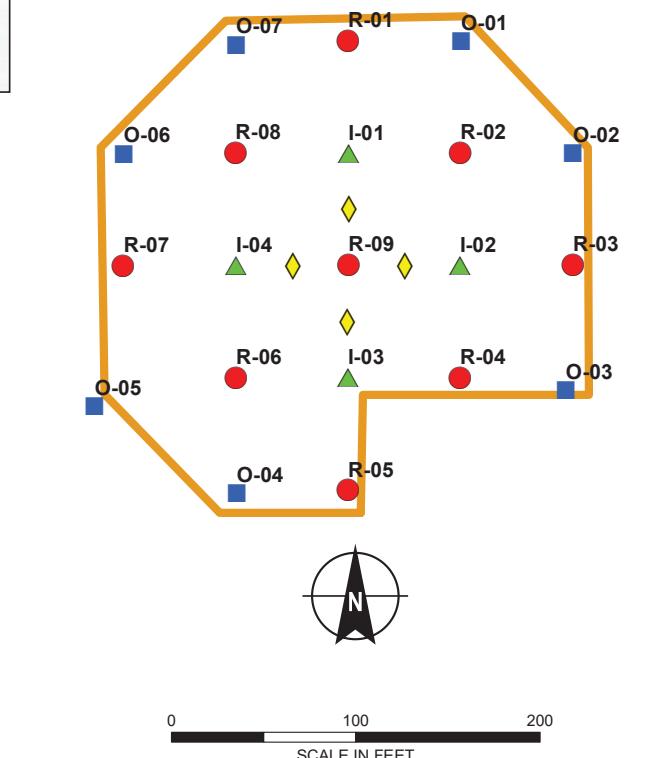
JUNE 2019 MAXIMUM GROUNDWATER ELEVATIONS



JUNE 2019 AVERAGE GROUNDWATER ELEVATIONS

WELL ID	MINIMUM WLE (ft AMSL)	MINIMUM WLE DATE	MAXIMUM WLE (ft AMSL)	MAXIMUM WLE DATE	AVERAGE WLE (ft AMSL)
R-01	1217.49	06/24/19	1242.89	06/02/19	1230.08
R-02	1201.45	06/10/19	1231.31	06/12/19	1221.50
R-03	1198.47	06/23/19	1233.28	06/12/19	1220.73
R-04	1189.35	06/30/19	1229.54	06/01/19	1211.52
R-05	1204.55	06/26/19	1233.07	06/12/19	1219.84
R-06	1190.78	06/30/19	1233.93	06/02/19	1214.60
R-07	1229.08	06/25/19	1241.50	06/14/19	1235.45
R-08	1217.85	06/26/19	1232.94	06/09/19	1225.68
R-09	1223.94	06/19/19	1248.43	06/12/19	1231.38
O-01	1229.68	06/11/19	1243.83	06/09/19	1237.84
O-02	1229.60	06/11/19	1244.09	06/12/19	1237.83
O-03	1228.66	06/26/19	1248.00	06/05/19	1237.58
O-04	1230.34	06/26/19	1243.40	06/05/19	1237.22
O-05	1231.68	06/25/19	1243.23	06/15/19	1237.74
O-06	1231.20	06/11/19	1242.33	06/12/19	1237.46
O-07	1231.86	06/11/19	1244.28	06/09/19	1238.10

***GROUNDWATER CONTOURS GENERATED USING OUTER
RECOVERY AND OBSERVATION WELLS**



**HALEY
ALDRICH**

PRODUCTION TEST FACILITY
FLORENCE COPPER INC.
FLORENCE, ARIZONA

PTF WELLFIELD
POTENTIOMETRIC CONTOUR MAP
JUNE 2019

ATTACHMENT 4

LBFU Bulk Electrical Conductivity Contour Maps



HALEY & ALDRICH, INC.
One Arizona Center
400 E. Van Buren St., Suite 545
Phoenix, AZ 85004
602.760.2450

MEMORANDUM

26 July 2019
File No. 132473-003

TO: Florence Copper Inc.
Mr. Dan Johnson V.P., General Manager

C: Florence Copper Inc.
Mr. Ian Ream, Senior Hydrogeologist

FROM: Haley & Aldrich, Inc.
Mark Nicholls, R.G.

SUBJECT: Summary of Bulk Conductivity Monitoring Results, Second Quarter 2019
Production Test Facility
Florence Copper, Florence, Arizona



Haley & Aldrich, Inc. (Haley & Aldrich) has conducted statistical analysis of bulk electrical conductivity data collected by HydroGeophysics, Inc. at the Production Test Facility (PTF) located in Florence, Arizona, in accordance with Temporary Aquifer Protection Permit (APP) No. 106360 and the Underground Injection Control (UIC) Permit No R9UIC-AZ3-FR11-1. The procedures used to complete the analysis were described in the document titled *Procedures for Determining Bulk Electrical Conductivity Alert Levels* (Haley & Aldrich, 2018)¹. The alert levels (AL) for bulk electrical conductivity were approved in the letter issued by the U.S. Environmental Protection Agency dated 14 December 2018 and were adopted into the APP issued by the Arizona Department of Environmental Quality on 5 December 2018.

Alert Levels

To ensure that In-Situ Copper Recovery fluids do not enter the Lower Basin Fill Unit (LBFU) from the Bedrock Oxide Unit, the three upper horizons (1 through 3) are monitored. The following ALs were established for these horizons:

Electrode Pair Horizon	Proposed Alert Level (ohm-meters)
Horizon 1	9.93
Horizon 2	10.12
Horizon 3	10.33

¹ Haley & Aldrich, Inc., 2018. *Procedures for Determining Bulk Electrical Conductivity Alert Levels, Production Test Facility, Florence Copper Project*. August.

The ALs represent minimum values. Consequently, an exceedance is indicated if the measured apparent resistivity in one of these horizons is *lower* than the established AL on three adjacent or intersecting current paths.

Second Quarter 2019 Monitoring Results

Second quarter (Q2) 2019 includes 13 weekly monitoring events for bulk electrical conductivity between 4 April and 27 June. No AL exceedances occurred during the monitoring period. Linear contour maps for the monitoring period detail these results (Figures 1 through 13).

Data Summary

Tables 1 through 3 list the apparent resistivity results over this monitoring period for Horizons 1 through 3, respectively.

Relative to the baseline dataset, no outliers were detected on these monitoring dates (defined as values over 4 times the interquartile range outside the range around the data median). The grouped data from each horizon fall within the range of the baseline dataset (Attachment A).

Attachment B shows the data from each horizon over time, during the baseline period, and monitoring both before and after the PTF became operational. The data collected during Q2 is within the established tolerance limits.

Enclosures:

- Table 1 – Bulk Electrical Conductivity Monitoring Results, Horizon 1 (40 Feet Above LBFU/Oxide Contact)
- Table 2 – Bulk Electrical Conductivity Monitoring Results, Horizon 2 (20 Feet Above LBFU/Oxide Contact)
- Table 3 – Bulk Electrical Conductivity Monitoring Results, Horizon 3 (at LBFU/Oxide Contact)
- Figure 1 – Baseline Apparent Resistivity of Electrode Pairs by Horizon –4/4/2019, Production Test Facility
- Figure 2 – Baseline Apparent Resistivity of Electrode Pairs by Horizon –4/11/2019, Production Test Facility
- Figure 3 – Baseline Apparent Resistivity of Electrode Pairs by Horizon –4/18/2019, Production Test Facility
- Figure 4 – Baseline Apparent Resistivity of Electrode Pairs by Horizon –4/24/2019, Production Test Facility
- Figure 5 – Baseline Apparent Resistivity of Electrode Pairs by Horizon –5/02/2019, Production Test Facility
- Figure 6 – Baseline Apparent Resistivity of Electrode Pairs by Horizon –5/09/2019, Production Test Facility
- Figure 7 – Baseline Apparent Resistivity of Electrode Pairs by Horizon –5/16/2019, Production Test Facility
- Figure 8 – Baseline Apparent Resistivity of Electrode Pairs by Horizon –5/23/2019, Production Test Facility
- Figure 9 – Baseline Apparent Resistivity of Electrode Pairs by Horizon –5/30/2019, Production Test Facility
- Figure 10 – Baseline Apparent Resistivity of Electrode Pairs by Horizon –6/06/2019, Production Test Facility
- Figure 11 – Baseline Apparent Resistivity of Electrode Pairs by Horizon –6/13/2019, Production Test Facility
- Figure 12 – Baseline Apparent Resistivity of Electrode Pairs by Horizon –6/20/2019, Production Test Facility
- Figure 13 – Baseline Apparent Resistivity of Electrode Pairs by Horizon –6/27/2019, Production Test Facility
- Attachment A – Box Diagrams for Second Quarter Monitoring Data
- Attachment B – Summary Plot of Bulk Electrical Conductivity

TABLES

TABLE 1
BULK ELECTRICAL CONDUCTIVITY MONITORING RESULTS
HORIZON 1 (40 FEET ABOVE LBFU/OXIDE CONTACT)
FLORENCE COPPER PROJECT
FLORENCE, ARIZONA

Electrode 1	Electrode 2	Sending Well	Receiving Well	Apparent Resistivity ($\Omega\text{-m}$)												
				4/4/2019	4/11/2019	4/18/2019	4/24/2019	5/2/2019	5/9/2019	5/16/2019	5/23/2019	5/30/2019	6/6/2019	6/13/2019	6/20/2019	6/28/2019
B-01-BC-01	B-02-BC-01	O-01	O-02	12.90	12.86	12.84	12.90	12.91	12.90	12.93	12.94	12.96	12.97	12.93	12.95	12.96
B-01-BC-01	B-03-BC1-02	O-01	O-03	11.47	11.43	11.41	11.55	11.54	11.57	11.58	11.62	11.68	11.66	11.61	11.64	11.66
B-01-BC-01	B-04-BC-01	O-01	O-04	13.56	13.51	13.51	13.67	13.66	13.74	13.77	13.78	13.88	13.83	13.76	13.84	13.84
B-01-BC-01	B-05-BC-01	O-01	O-05	12.49	12.47	12.44	12.58	12.56	12.64	12.67	12.68	12.75	12.73	12.67	12.72	12.73
B-01-BC-01	B-06-BC-01	O-01	O-06	11.95	11.91	11.90	12.03	12.02	12.08	12.09	12.10	12.16	12.12	12.08	12.12	12.12
B-01-BC-01	B-07-BC1-02	O-01	O-07	11.91	11.89	11.87	11.95	11.96	12.00	11.99	11.99	12.04	12.01	11.99	12.00	12.03
B-02-BC-01	B-03-BC1-02	O-02	O-03	10.58	10.52	10.54	10.63	10.61	10.64	10.66	10.66	10.71	10.67	10.65	10.68	10.69
B-02-BC-01	B-04-BC-01	O-02	O-04	14.23	14.14	14.16	14.32	14.42	14.36	14.41	14.40	14.52	14.46	14.41	14.46	14.52
B-02-BC-01	B-05-BC-01	O-02	O-05	13.79	13.70	13.70	13.85	13.85	13.93	13.96	13.98	14.05	14.04	13.97	14.00	14.03
B-02-BC-01	B-06-BC-01	O-02	O-06	13.77	13.69	13.68	13.86	13.82	13.90	13.91	13.93	14.01	13.98	13.91	13.96	13.98
B-02-BC-01	B-07-BC1-02	O-02	O-07	12.59	12.53	12.53	12.65	12.64	12.70	12.71	12.71	12.78	12.74	12.70	12.74	12.75
B-03-BC1-02	B-04-BC-01	O-03	O-04	12.77	12.70	12.68	12.82	12.80	12.83	12.85	12.86	12.94	12.93	12.85	12.90	12.92
B-03-BC1-02	B-05-BC-01	O-03	O-05	13.23	13.14	13.12	13.26	13.27	13.31	13.34	13.34	13.44	13.43	13.34	13.39	13.40
B-03-BC1-02	B-06-BC-01	O-03	O-06	14.39	14.26	14.30	14.46	14.41	14.51	14.53	14.54	14.63	14.60	14.53	14.58	14.60
B-03-BC1-02	B-07-BC1-02	O-03	O-07	13.59	13.48	13.48	13.64	13.62	13.69	13.72	13.72	13.81	13.78	13.71	13.76	13.79
B-04-BC-01	B-05-BC-01	O-04	O-05	10.86	10.83	10.81	10.88	10.88	10.90	10.91	10.90	10.94	10.93	10.90	10.90	10.91
B-04-BC-01	B-06-BC-01	O-04	O-06	12.32	12.24	12.24	12.36	12.34	12.41	12.42	12.43	12.50	12.49	12.43	12.46	12.48
B-04-BC-01	B-07-BC1-02	O-04	O-07	12.99	12.90	12.88	13.05	13.03	13.10	13.14	13.16	13.24	13.19	13.07	13.19	13.21
B-05-BC-01	B-06-BC-01	O-05	O-06	10.10	10.07	10.05	10.14	10.12	10.16	10.18	10.19	10.22	10.19	10.17	10.20	10.21
B-05-BC-01	B-07-BC1-02	O-05	O-07	10.94	10.90	10.88	10.99	10.99	11.04	11.05	11.06	11.13	11.09	11.07	11.09	11.11
B-06-BC-01	B-07-BC1-02	O-06	O-07	10.09	10.06	10.05	10.13	10.13	10.15	10.14	10.16	10.18	10.16	10.15	10.17	10.16

Notes

$\Omega\text{-m}$ = ohm-meters

LBFU = lower basin-fill unit

Oxide = bedrock oxide unit

TABLE 2

BULK ELECTRICAL CONDUCTIVITY MONITORING RESULTS

HORIZON 2 (20 FEET ABOVE LBFU/OXIDE CONTACT)

FLORENCE COPPER PROJECT

FLORENCE, ARIZONA

Electrode 1	Electrode 2	Sending Well	Receiving Well	Apparent Resistivity ($\Omega\text{-m}$)												
				4/4/2019	4/11/2019	4/18/2019	4/24/2019	5/2/2019	5/9/2019	5/16/2019	5/23/2019	5/30/2019	6/6/2019	6/13/2019	6/20/2019	6/28/2019
B-01-BC-02	B-02-BC-02	O-01	O-02	14.69	14.66	14.65	14.69	14.68	14.70	14.73	14.73	14.76	14.71	14.72	14.73	14.74
B-01-BC-02	B-03-BC1-04	O-01	O-03	11.56	11.52	11.51	11.63	11.62	11.67	11.70	11.72	11.78	11.74	11.72	11.74	11.74
B-01-BC-02	B-04-BC-02	O-01	O-04	13.45	13.41	13.39	13.56	13.54	13.61	13.66	13.67	13.77	13.74	13.69	13.73	13.75
B-01-BC-02	B-05-BC-02	O-01	O-05	12.33	12.31	12.29	12.43	12.43	12.49	12.55	12.56	12.62	12.59	12.56	12.57	12.60
B-01-BC-02	B-06-BC-02	O-01	O-06	11.81	11.78	11.79	11.90	11.88	11.93	11.96	11.98	12.03	11.99	11.97	11.95	12.01
B-01-BC-02	B-07-BC1-04	O-01	O-07	11.87	11.86	11.85	11.91	11.91	11.94	11.96	11.97	12.01	11.97	11.96	11.98	11.98
B-02-BC-02	B-03-BC1-04	O-02	O-03	11.25	11.22	11.22	11.30	11.28	11.33	11.34	11.34	11.39	11.37	11.33	11.35	11.36
B-02-BC-02	B-04-BC-02	O-02	O-04	14.30	14.22	14.23	14.39	14.38	14.47	14.50	14.51	14.60	14.57	14.52	14.58	14.58
B-02-BC-02	B-05-BC-02	O-02	O-05	13.81	13.72	13.75	13.90	13.90	13.93	14.00	14.03	14.10	14.05	14.01	14.06	14.08
B-02-BC-02	B-06-BC-02	O-02	O-06	13.81	13.72	13.73	13.91	13.85	13.93	13.96	13.99	14.06	14.02	13.96	14.00	14.03
B-02-BC-02	B-07-BC1-04	O-02	O-07	12.56	12.51	12.53	12.63	12.62	12.67	12.70	12.70	12.78	12.75	12.71	12.74	12.75
B-03-BC1-04	B-04-BC-02	O-03	O-04	12.75	12.65	12.69	12.79	12.78	12.83	12.83	12.86	12.92	12.88	12.84	12.86	12.88
B-03-BC1-04	B-05-BC-02	O-03	O-05	13.09	12.99	13.02	13.14	13.14	13.19	13.21	13.23	13.30	13.25	13.23	13.25	13.28
B-03-BC1-04	B-06-BC-02	O-03	O-06	14.26	14.16	14.16	14.34	14.30	14.36	14.41	14.42	14.52	14.46	14.40	14.47	14.49
B-03-BC1-04	B-07-BC1-04	O-03	O-07	13.34	13.26	13.24	13.40	13.39	13.45	13.48	13.50	13.58	13.53	13.48	13.54	13.56
B-04-BC-02	B-05-BC-02	O-04	O-05	11.23	11.19	11.19	11.22	11.23	11.25	11.25	11.27	11.28	11.28	11.26	11.24	11.27
B-04-BC-02	B-06-BC-02	O-04	O-06	12.30	12.23	12.23	12.34	12.33	12.39	12.42	12.43	12.48	12.45	12.43	12.44	12.48
B-04-BC-02	B-07-BC1-04	O-04	O-07	12.77	12.70	12.70	12.82	12.80	12.87	12.91	12.94	13.02	12.97	12.94	12.98	12.97
B-05-BC-02	B-06-BC-02	O-05	O-06	10.33	10.30	10.30	10.36	10.36	10.39	10.41	10.40	10.45	10.41	10.39	10.42	10.43
B-05-BC-02	B-07-BC1-04	O-05	O-07	10.78	10.73	10.72	10.84	10.82	10.88	10.90	10.91	10.96	10.92	10.90	10.93	10.95
B-06-BC-02	B-07-BC1-04	O-06	O-07	10.86	10.83	10.82	10.90	10.89	10.88	10.90	10.91	10.95	10.92	10.91	10.90	10.92

Notes

 $\Omega\text{-m}$ = ohm-meters

LBFU = lower basin-fill unit

Oxide = bedrock oxide unit

TABLE 3
BULK ELECTRICAL CONDUCTIVITY MONITORING RESULTS
HORIZON 3 (AT LBFU/OXIDE CONTACT)
FLORENCE COPPER PROJECT
FLORENCE, ARIZONA

Electrode 1	Electrode 2	Sending Well	Receiving Well	Apparent Resistivity (Ω-m)												
				4/4/2019	4/11/2019	4/18/2019	4/24/2019	5/2/2019	5/9/2019	5/16/2019	5/23/2019	5/30/2019	6/6/2019	6/13/2019	6/20/2019	6/28/2019
B-01-BC-03	B-02-BC-03	O-01	O-02	15.58	15.52	15.54	15.59	15.55	15.59	15.61	15.60	15.62	15.60	15.56	15.61	15.62
B-01-BC-03	B-03-BC2-02	O-01	O-03	11.62	11.59	11.59	11.73	11.70	11.75	11.80	11.80	11.86	11.82	11.78	11.83	11.84
B-01-BC-03	B-04-BC-03	O-01	O-04	13.25	13.29	13.30	13.41	13.42	13.53	13.56	13.58	13.67	13.59	13.60	13.64	13.66
B-01-BC-03	B-05-BC-03	O-01	O-05	12.17	12.19	12.19	12.32	12.31	12.40	12.41	12.44	12.51	12.46	12.47	12.49	12.49
B-01-BC-03	B-06-BC-03	O-01	O-06	11.63	11.64	11.64	11.74	11.73	11.80	11.82	11.87	11.90	11.85	11.82	11.87	11.87
B-01-BC-03	B-07-BC2-02	O-01	O-07	12.10	12.09	12.09	12.15	12.17	12.20	12.20	12.21	12.26	12.21	12.20	12.22	12.23
B-02-BC-03	B-03-BC2-02	O-02	O-03	11.61	11.58	11.58	11.66	11.63	11.66	11.70	11.71	11.74	11.71	11.69	11.72	11.71
B-02-BC-03	B-04-BC-03	O-02	O-04	14.10	14.05	14.04	14.15	14.20	14.27	14.32	14.36	14.43	14.40	14.34	14.41	14.40
B-02-BC-03	B-05-BC-03	O-02	O-05	13.62	13.58	13.56	13.73	13.71	13.78	13.82	13.83	13.91	13.87	13.84	13.89	13.89
B-02-BC-03	B-06-BC-03	O-02	O-06	13.62	13.58	13.58	13.75	13.72	13.79	13.82	13.85	13.92	13.85	13.81	13.87	13.89
B-02-BC-03	B-07-BC2-02	O-02	O-07	12.65	12.60	12.60	12.71	12.72	12.76	12.77	12.79	12.86	12.82	12.79	12.82	12.80
B-03-BC2-02	B-04-BC-03	O-03	O-04	12.65	12.60	12.61	12.69	12.69	12.75	12.79	12.79	12.84	12.82	12.80	12.81	12.82
B-03-BC2-02	B-05-BC-03	O-03	O-05	13.03	12.98	12.99	13.10	13.09	13.14	13.18	13.22	13.27	13.25	13.22	13.23	13.26
B-03-BC2-02	B-06-BC-03	O-03	O-06	14.25	14.19	14.18	14.36	14.33	14.39	14.43	14.46	14.54	14.50	14.42	14.50	14.53
B-03-BC2-02	B-07-BC2-02	O-03	O-07	13.30	13.23	13.21	13.38	13.36	13.43	13.47	13.48	13.55	13.52	13.46	13.52	13.53
B-04-BC-03	B-05-BC-03	O-04	O-05	11.94	11.92	11.93	11.96	11.97	11.98	11.99	11.98	12.00	11.99	11.99	11.98	11.99
B-04-BC-03	B-06-BC-03	O-04	O-06	12.38	12.33	12.32	12.46	12.44	12.47	12.52	12.53	12.59	12.55	12.51	12.55	12.57
B-04-BC-03	B-07-BC2-02	O-04	O-07	12.59	12.52	12.53	12.68	12.67	12.71	12.79	12.79	12.86	12.82	12.79	12.82	12.85
B-05-BC-03	B-06-BC-03	O-05	O-06	10.61	10.58	10.58	10.64	10.65	10.66	10.69	10.69	10.72	10.70	10.67	10.71	10.71
B-05-BC-03	B-07-BC2-02	O-05	O-07	10.62	10.59	10.58	10.69	10.70	10.73	10.76	10.76	10.82	10.80	10.76	10.79	10.81
B-06-BC-03	B-07-BC2-02	O-06	O-07	11.08	11.04	11.02	11.11	11.10	11.12	11.12	11.12	11.14	11.11	11.12	11.12	11.16

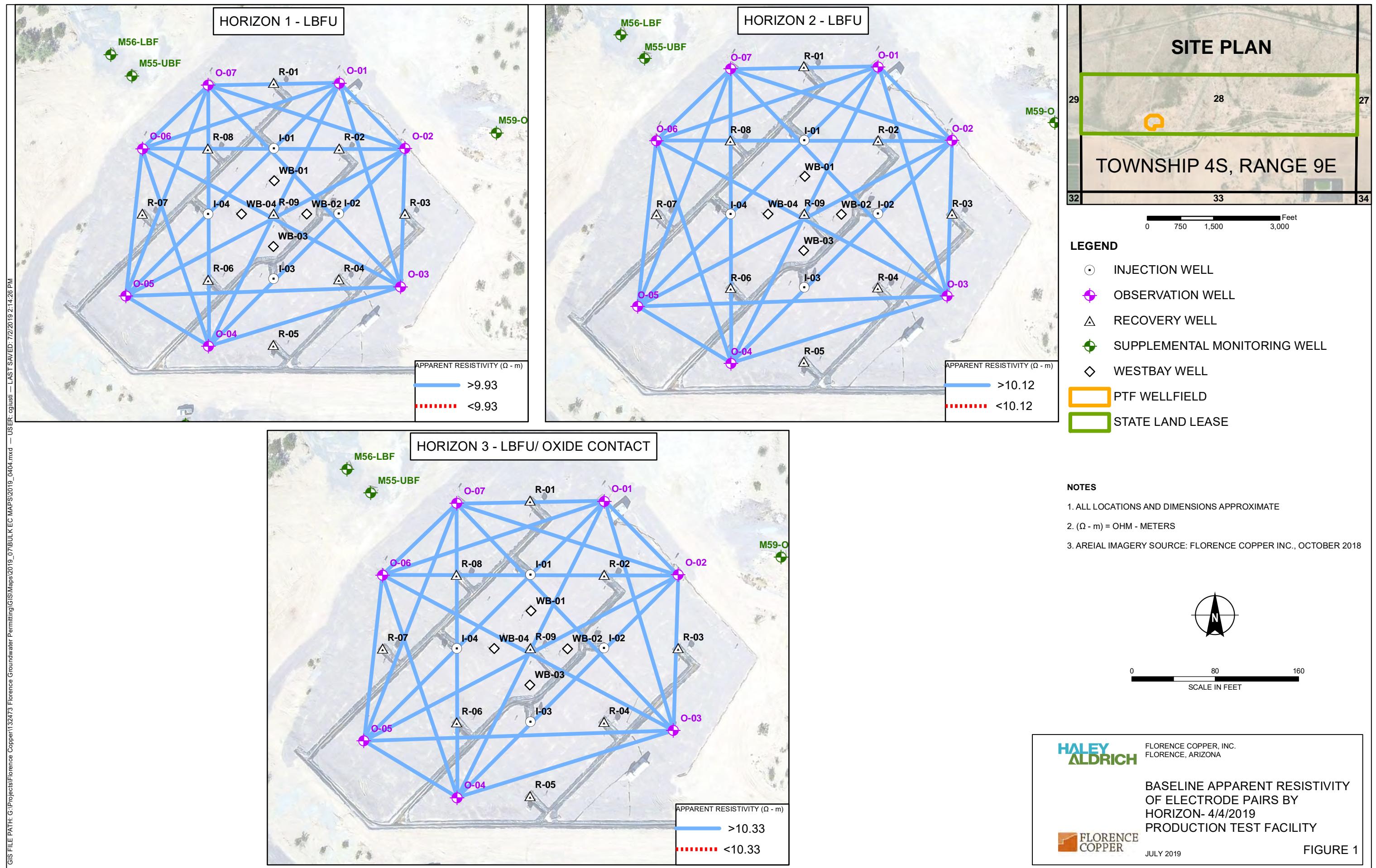
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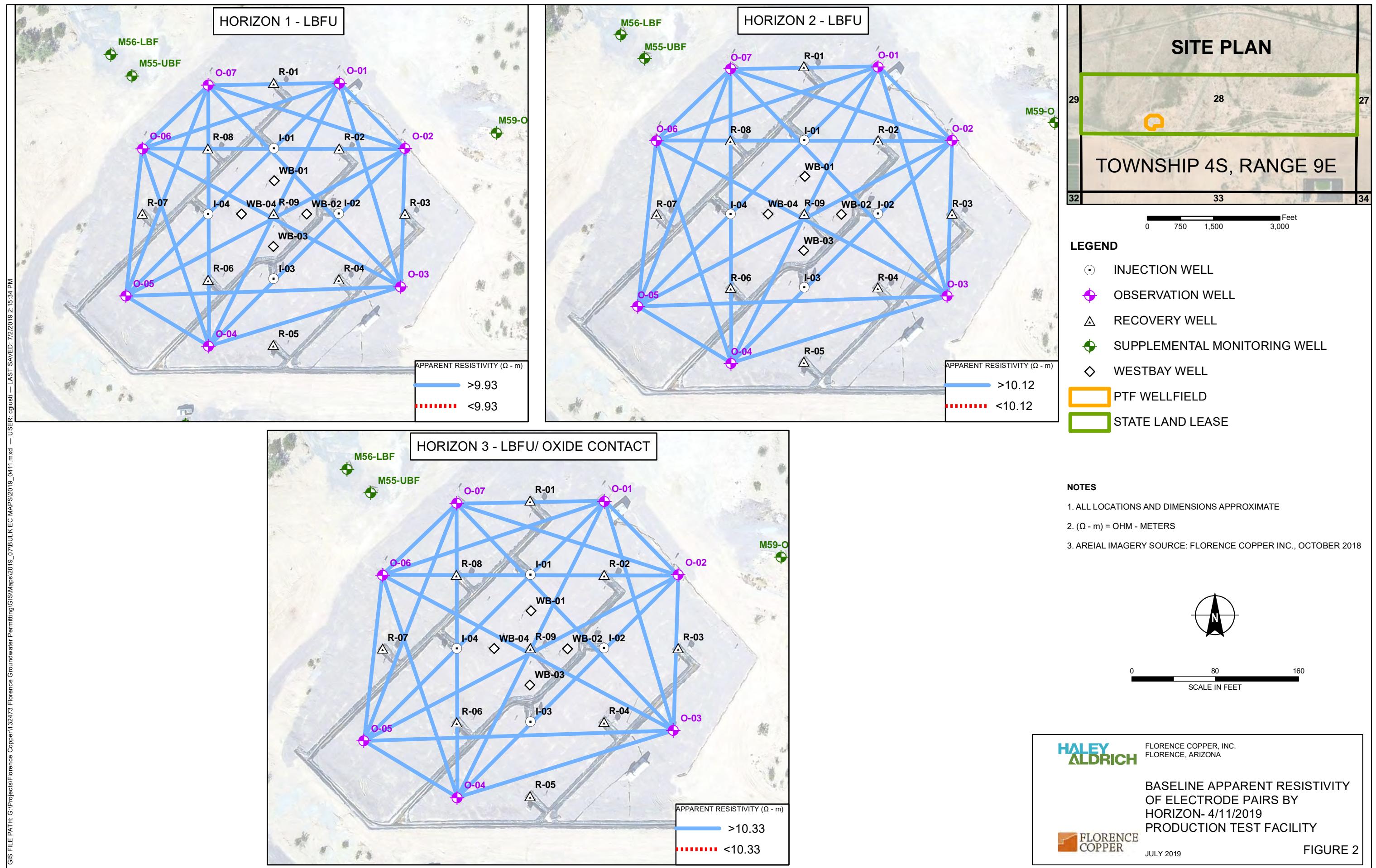
Ω-m = ohm-meters

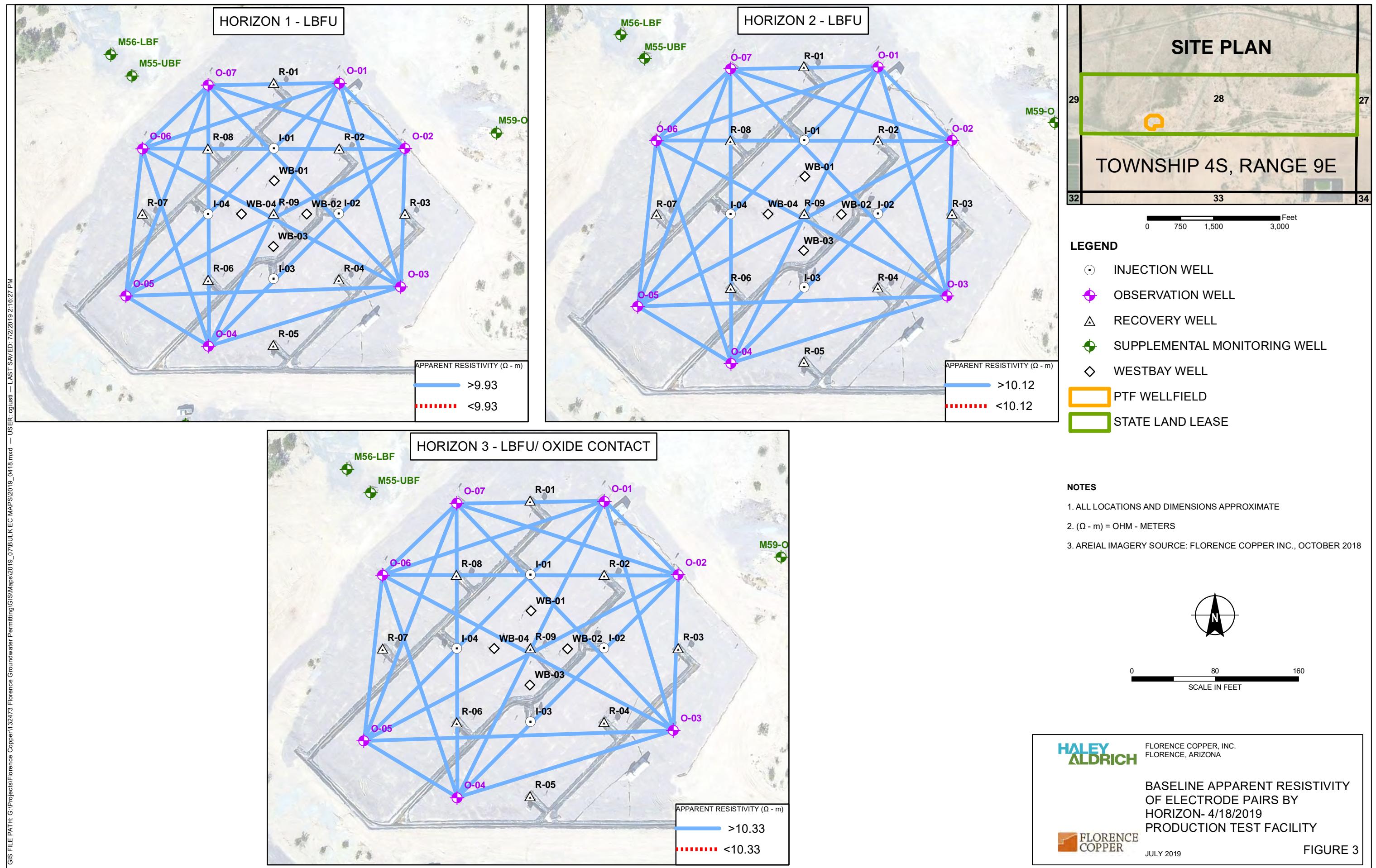
LBFU = lower basin-fill unit

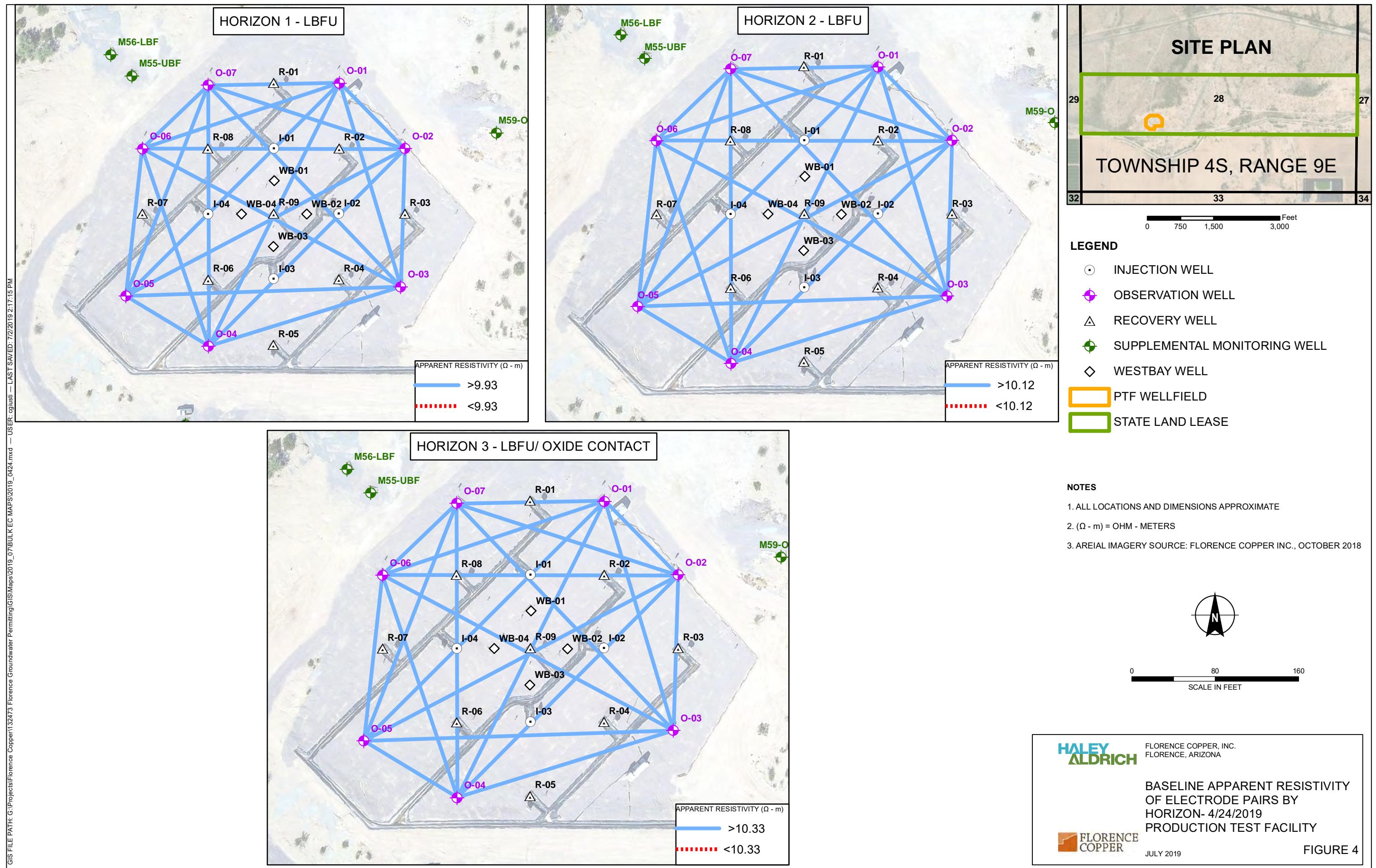
Oxide = bedrock oxide unit

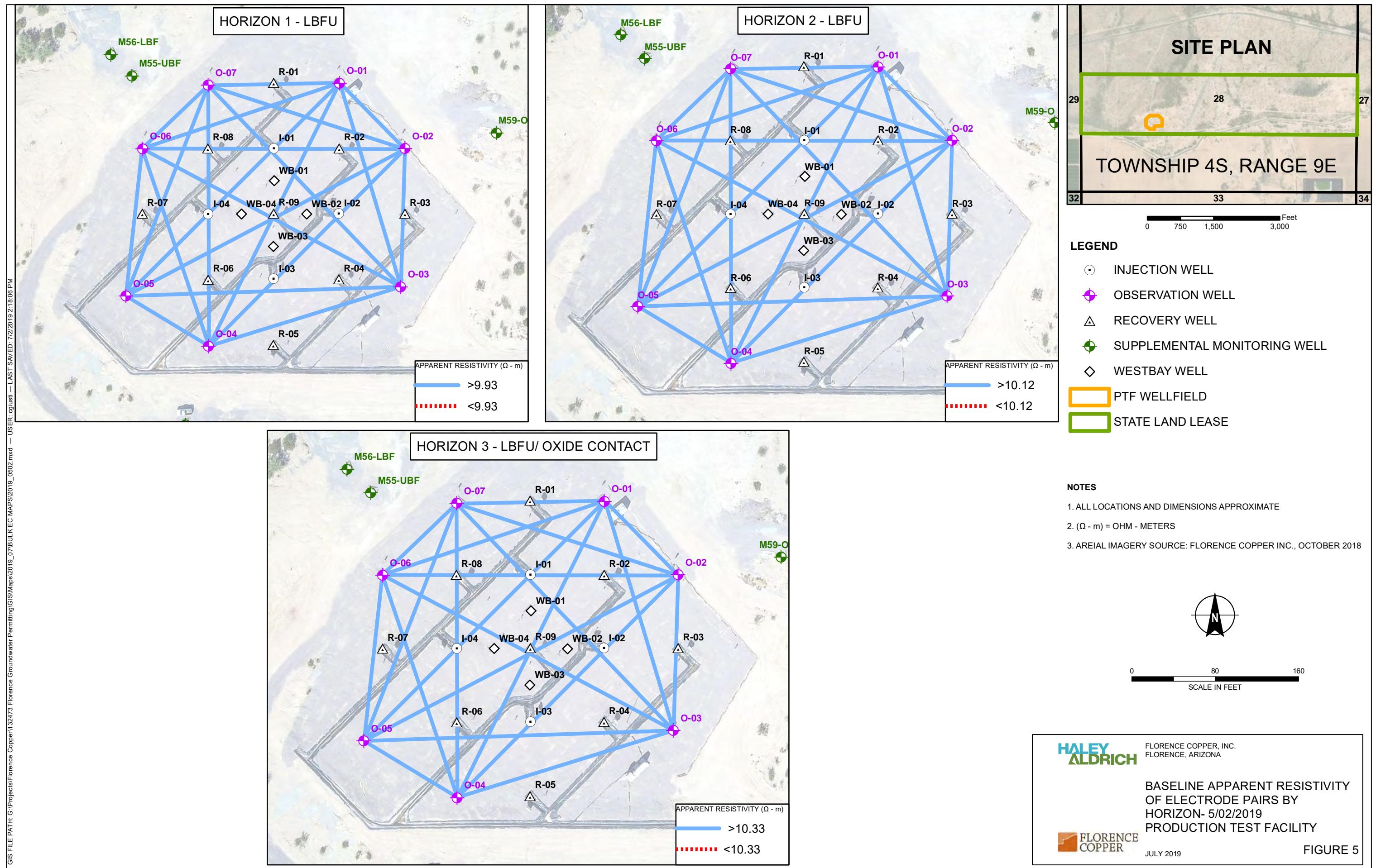
FIGURES

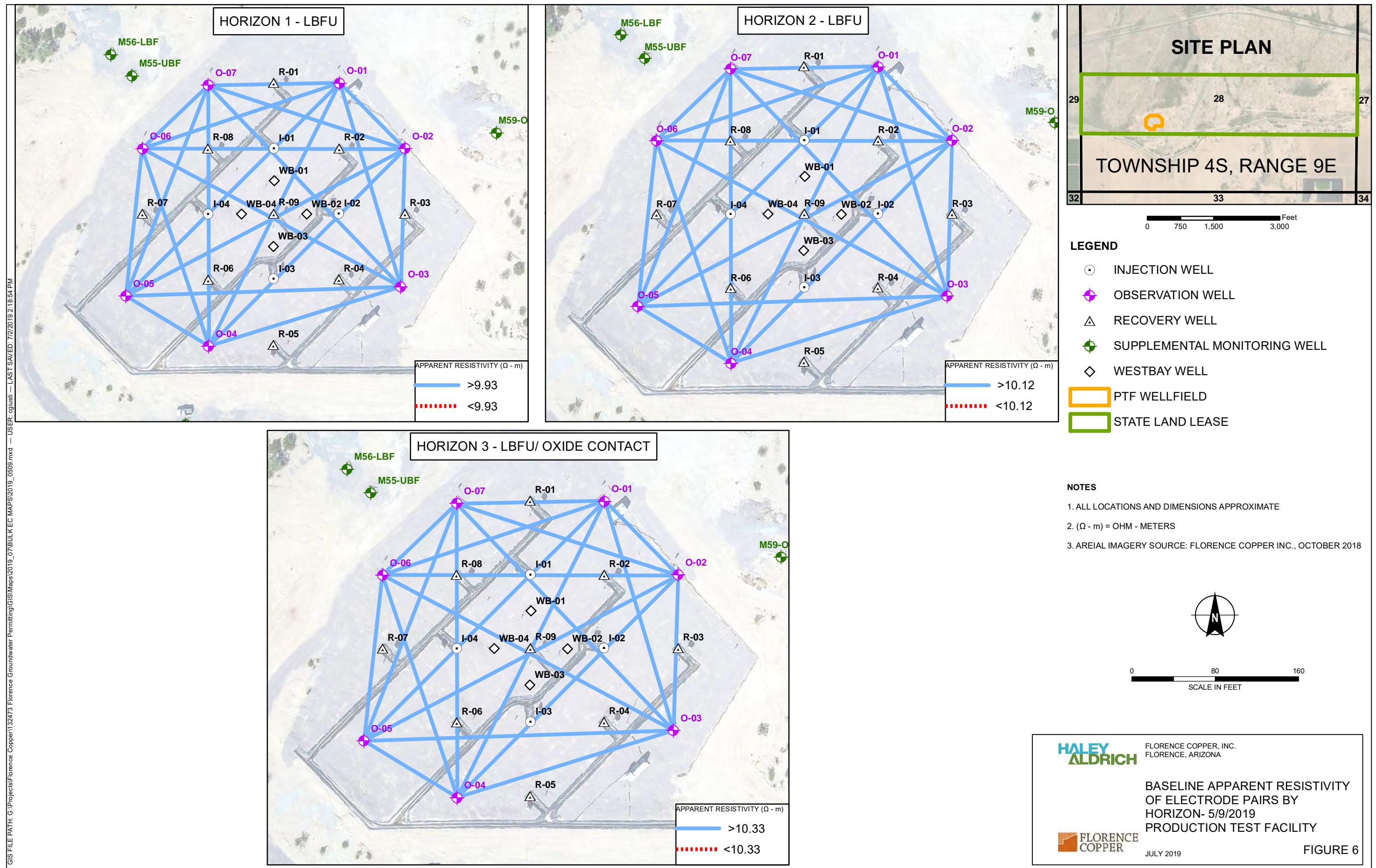


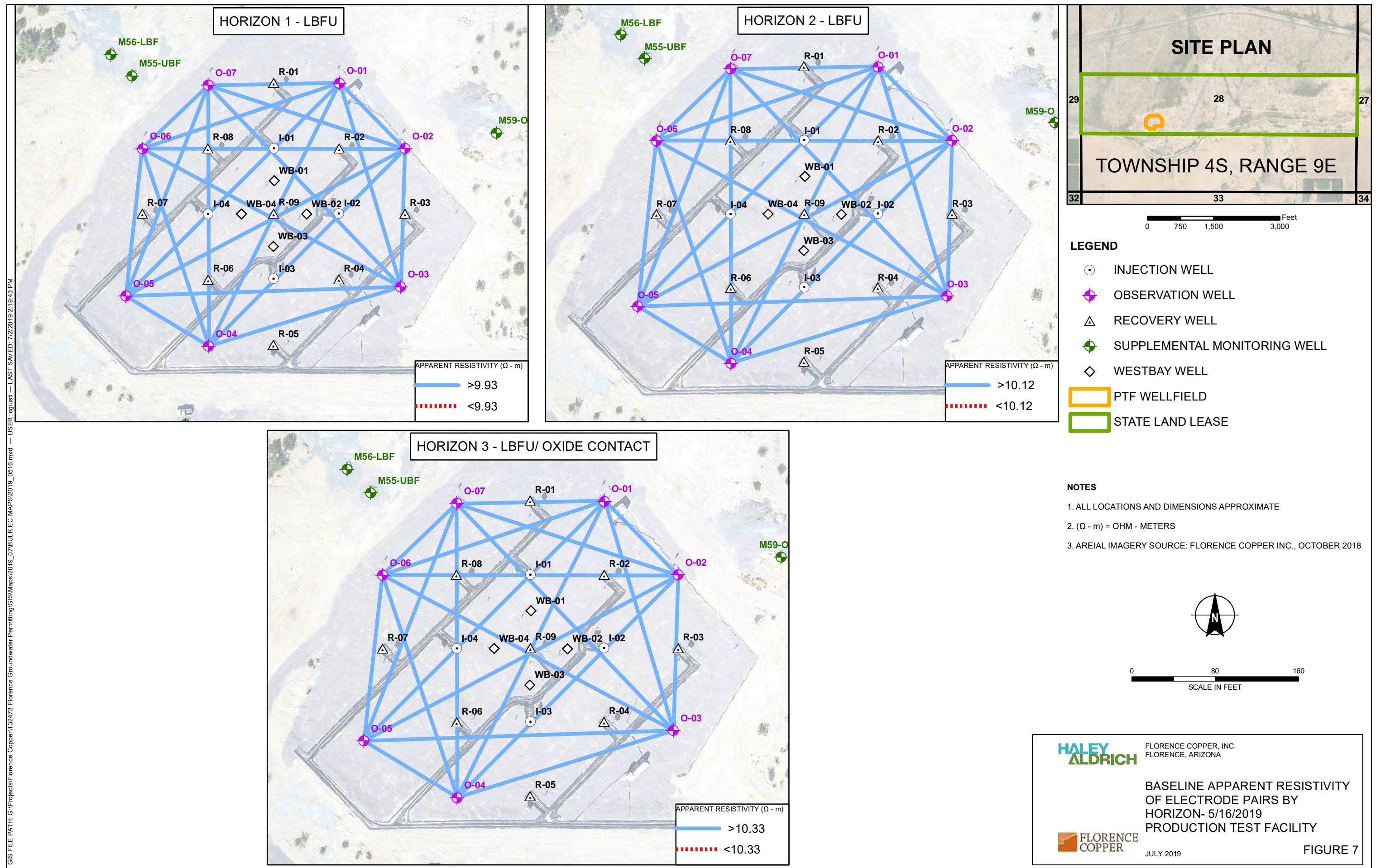


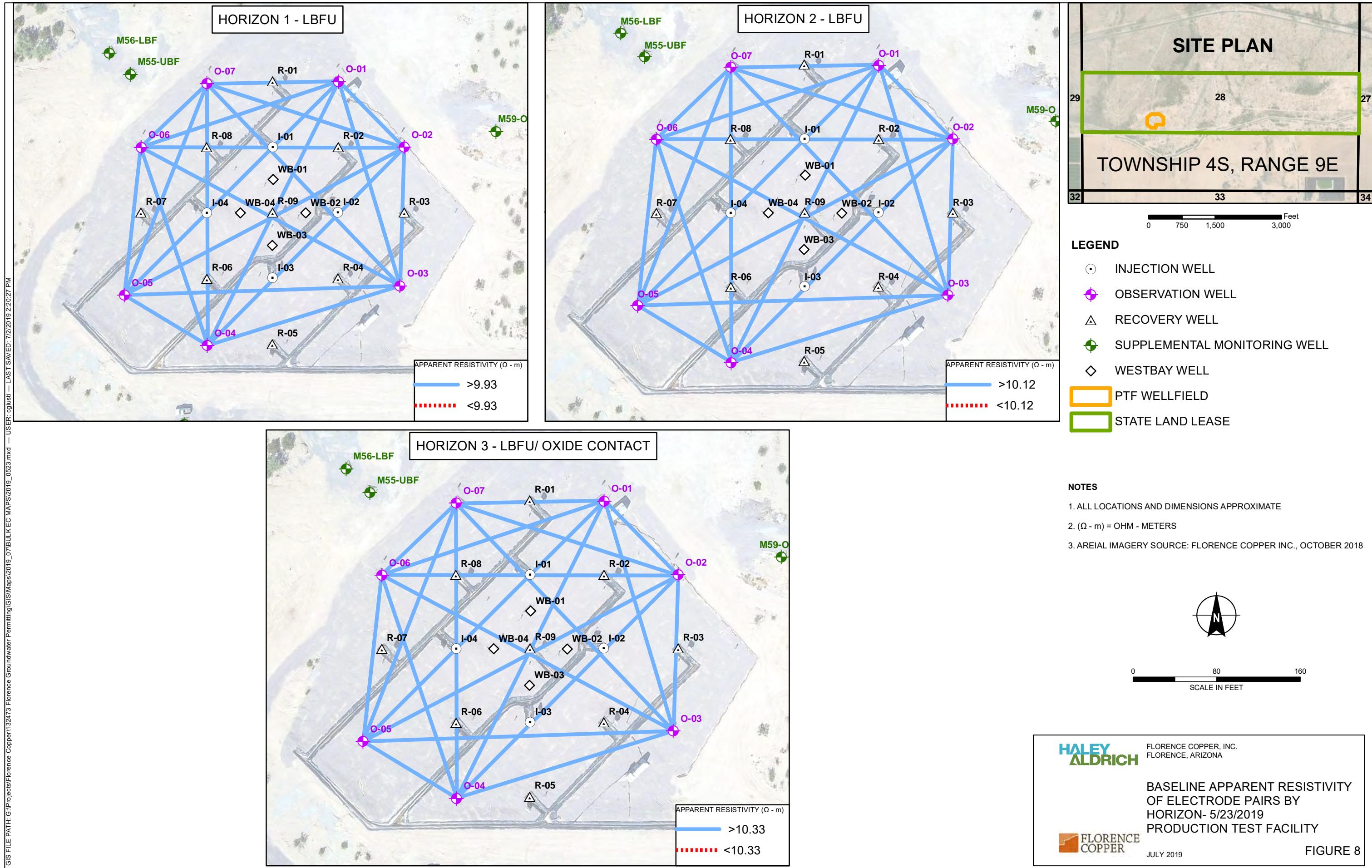


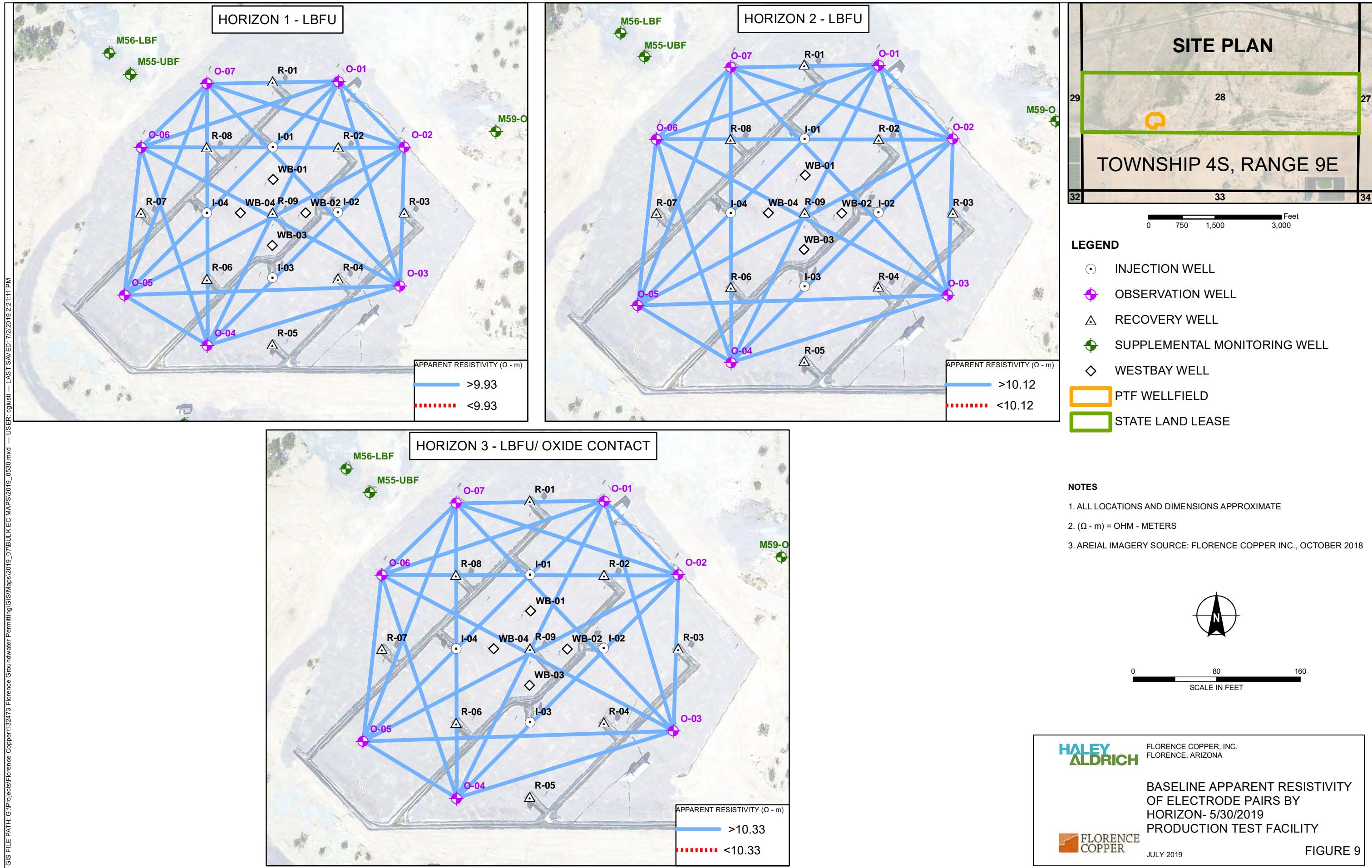


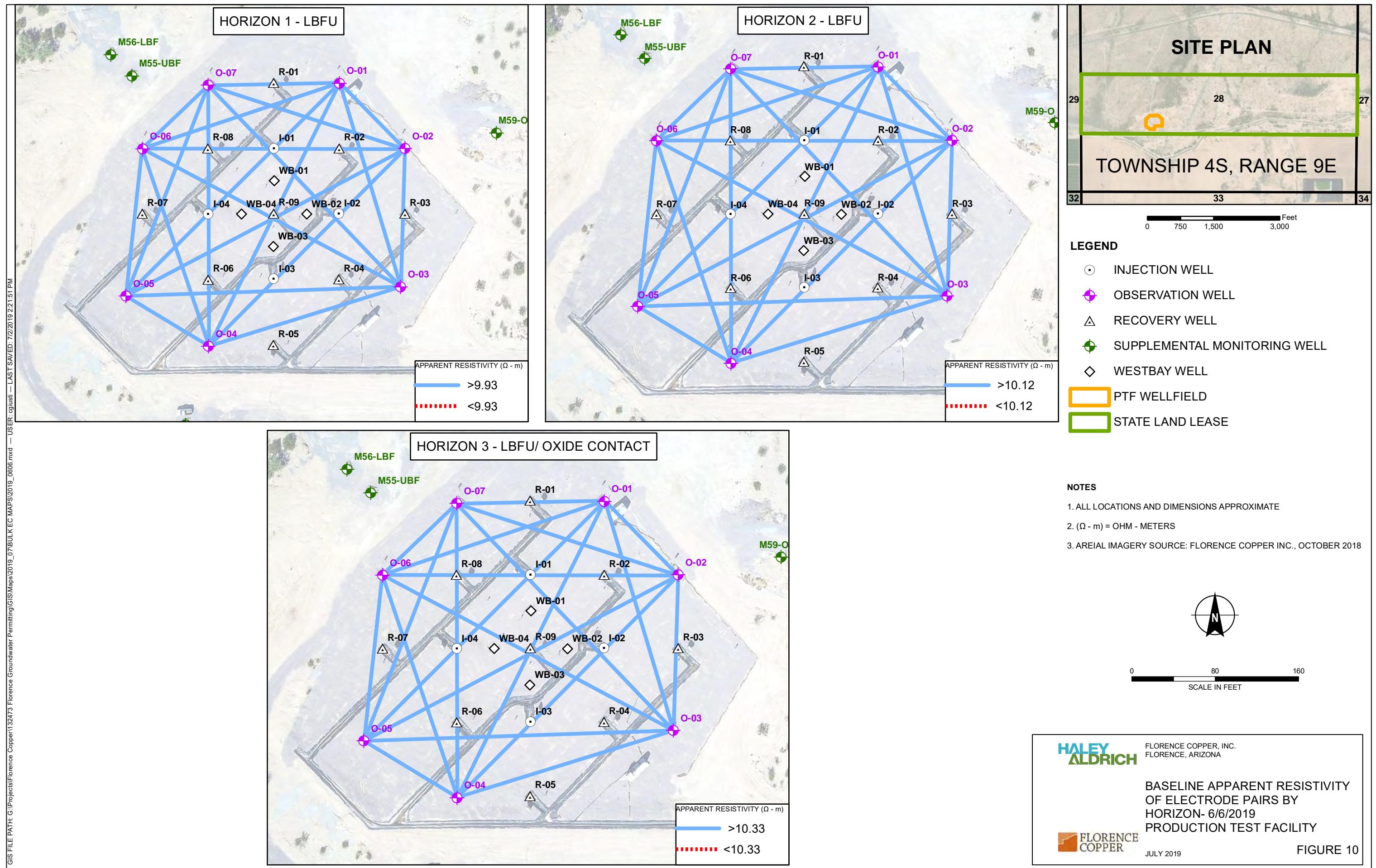


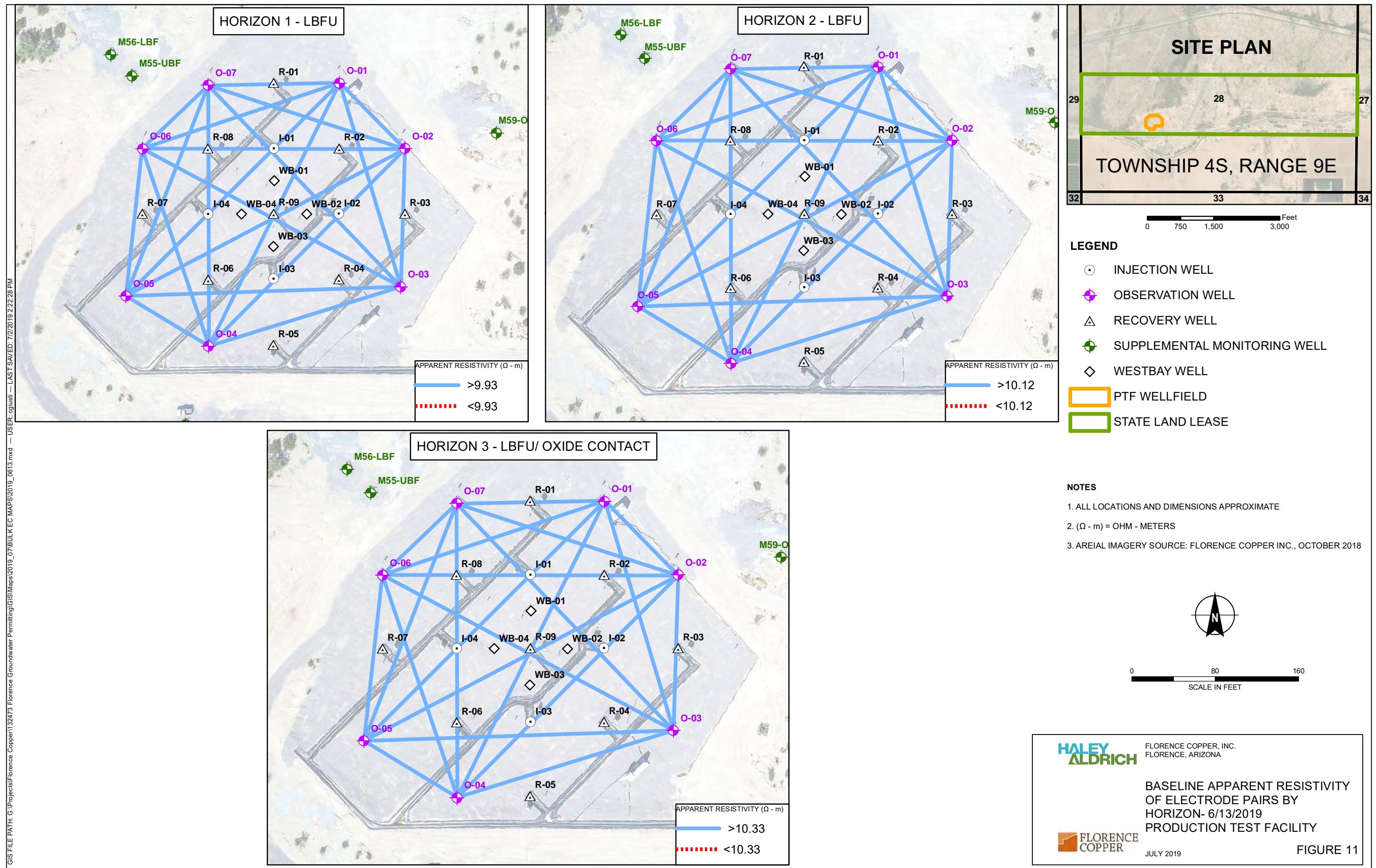


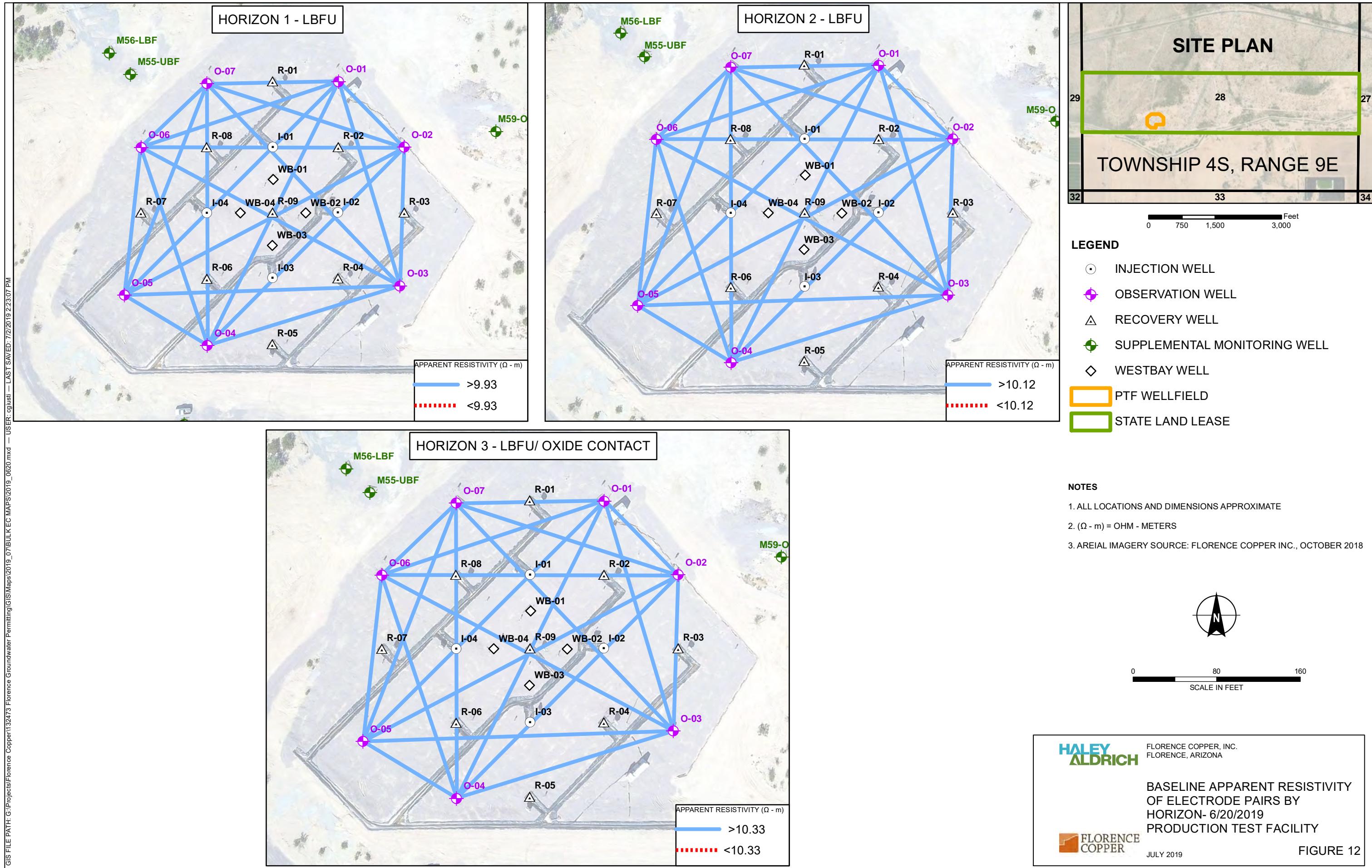


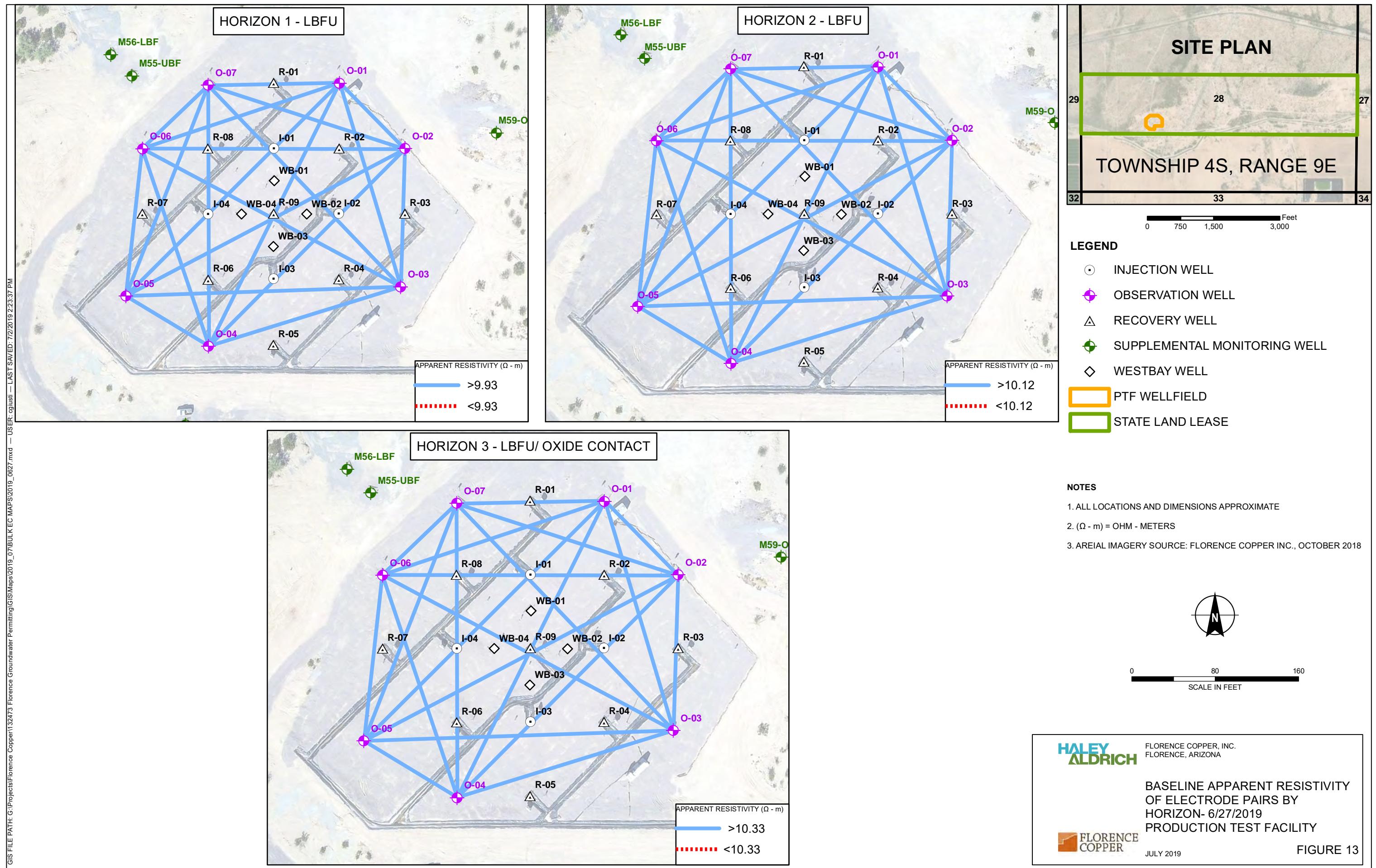








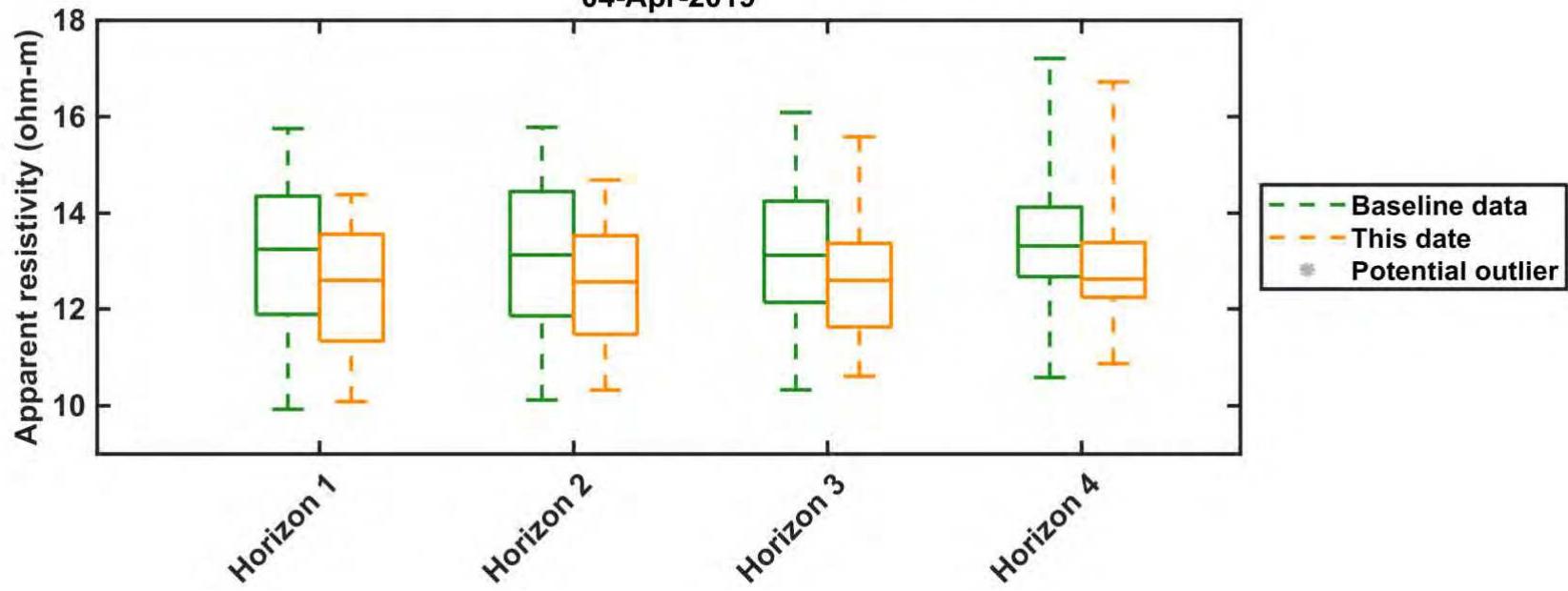




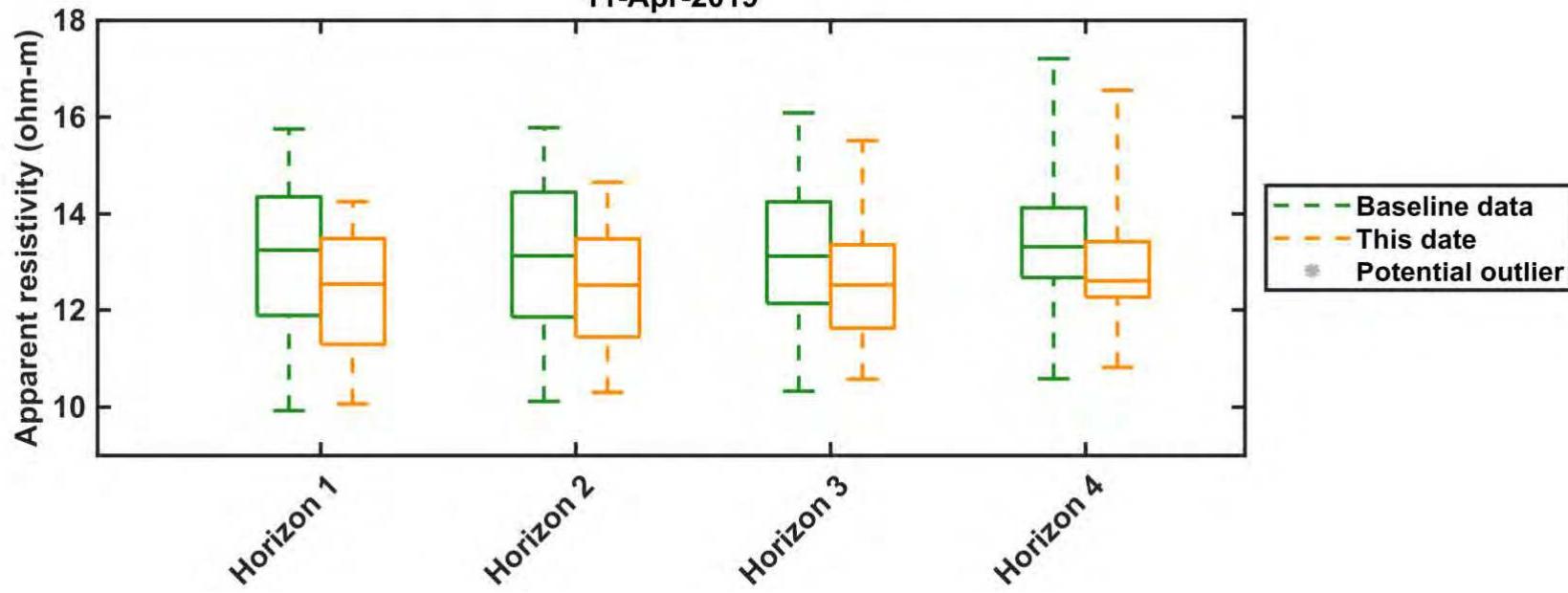
ATTACHMENT A

Box Diagrams for Second Quarter Monitoring Data

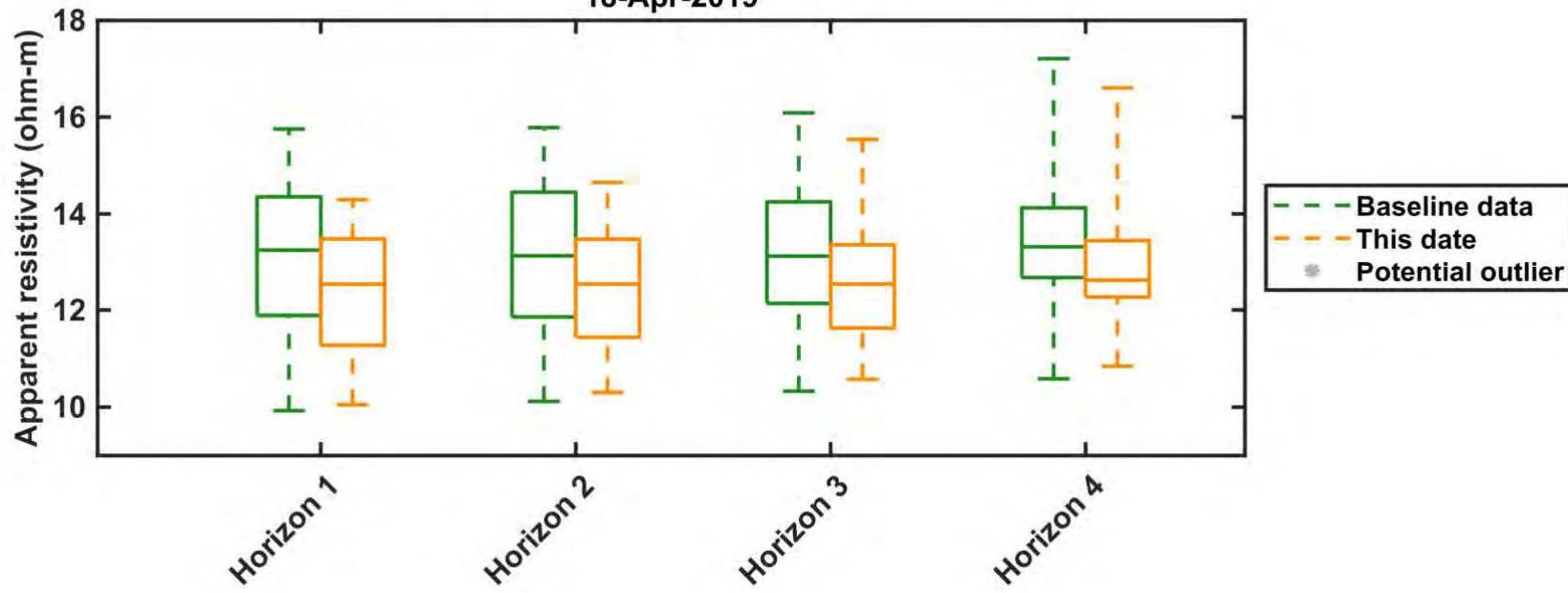
Florence electrical conductivity monitoring
04-Apr-2019



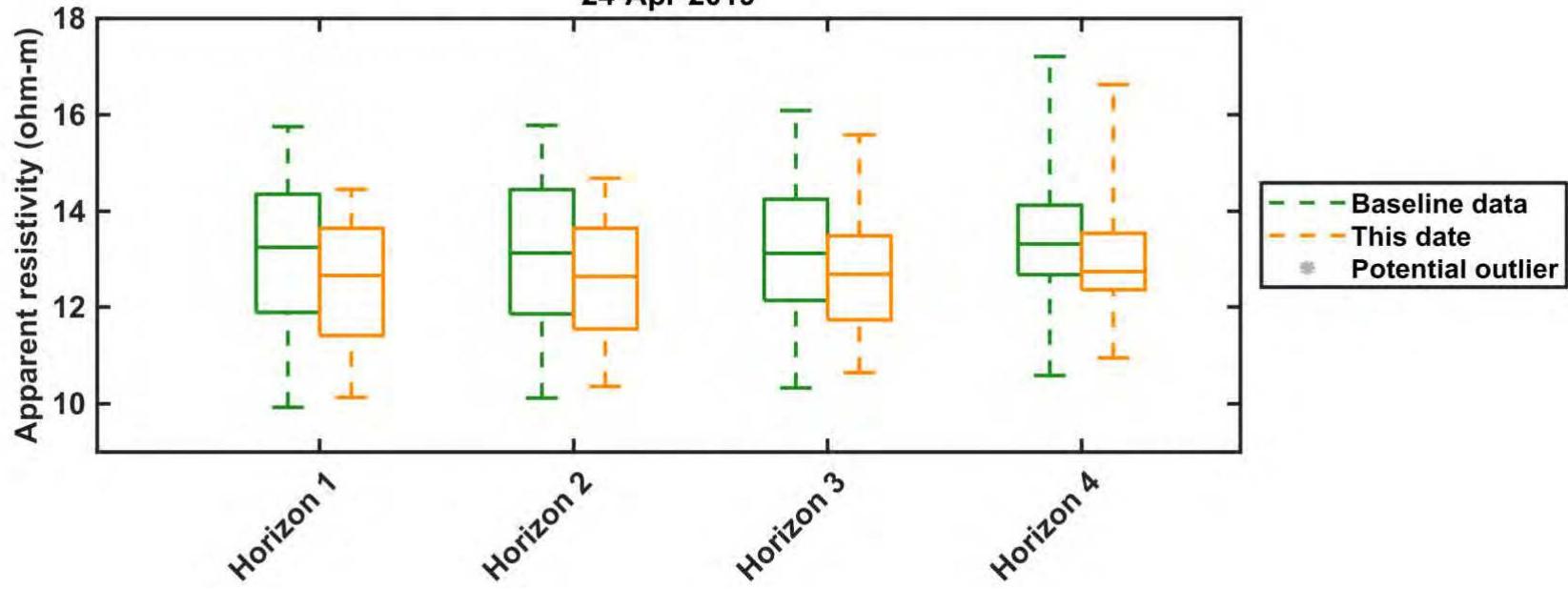
Florence electrical conductivity monitoring
11-Apr-2019



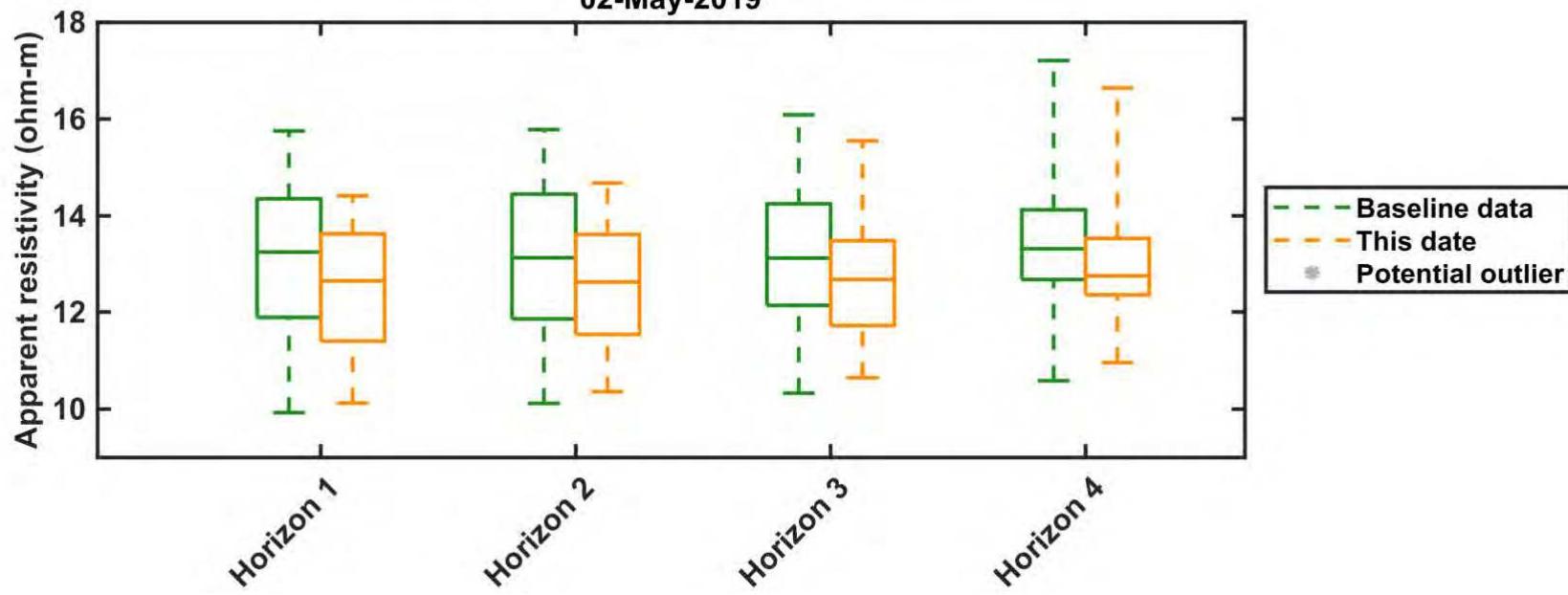
Florence electrical conductivity monitoring
18-Apr-2019



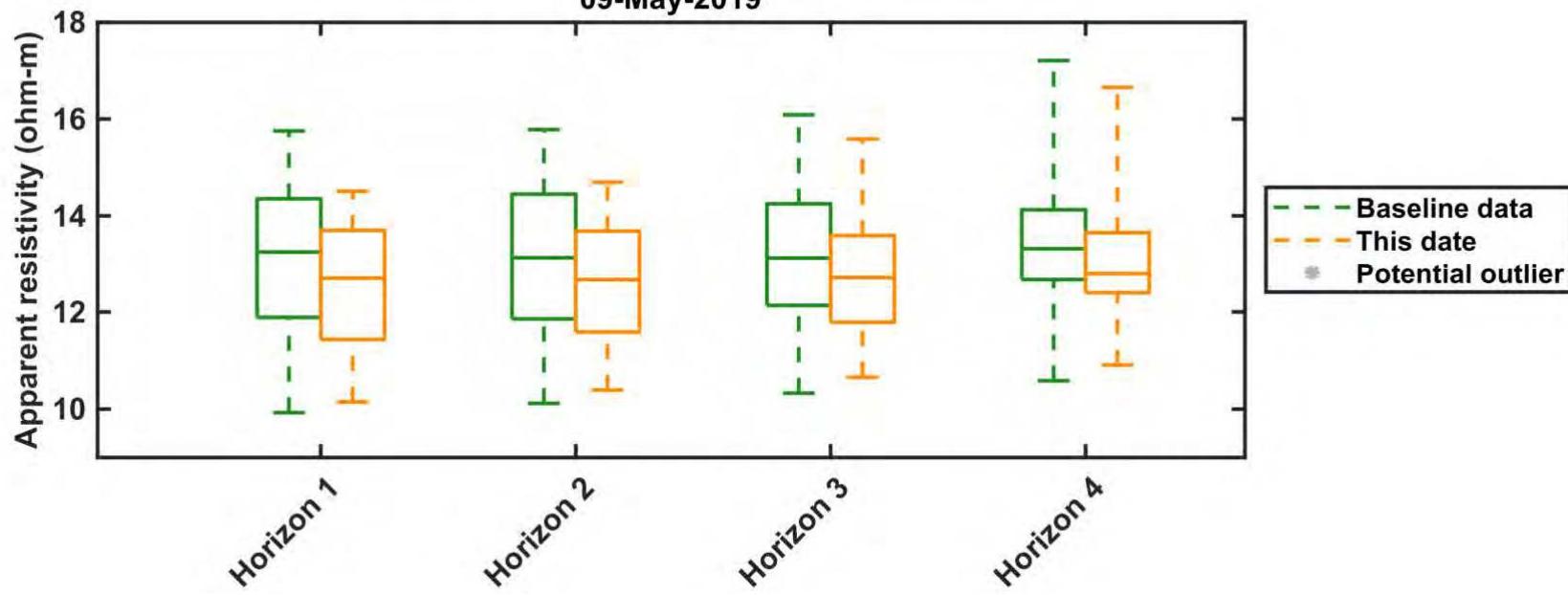
Florence electrical conductivity monitoring
24-Apr-2019



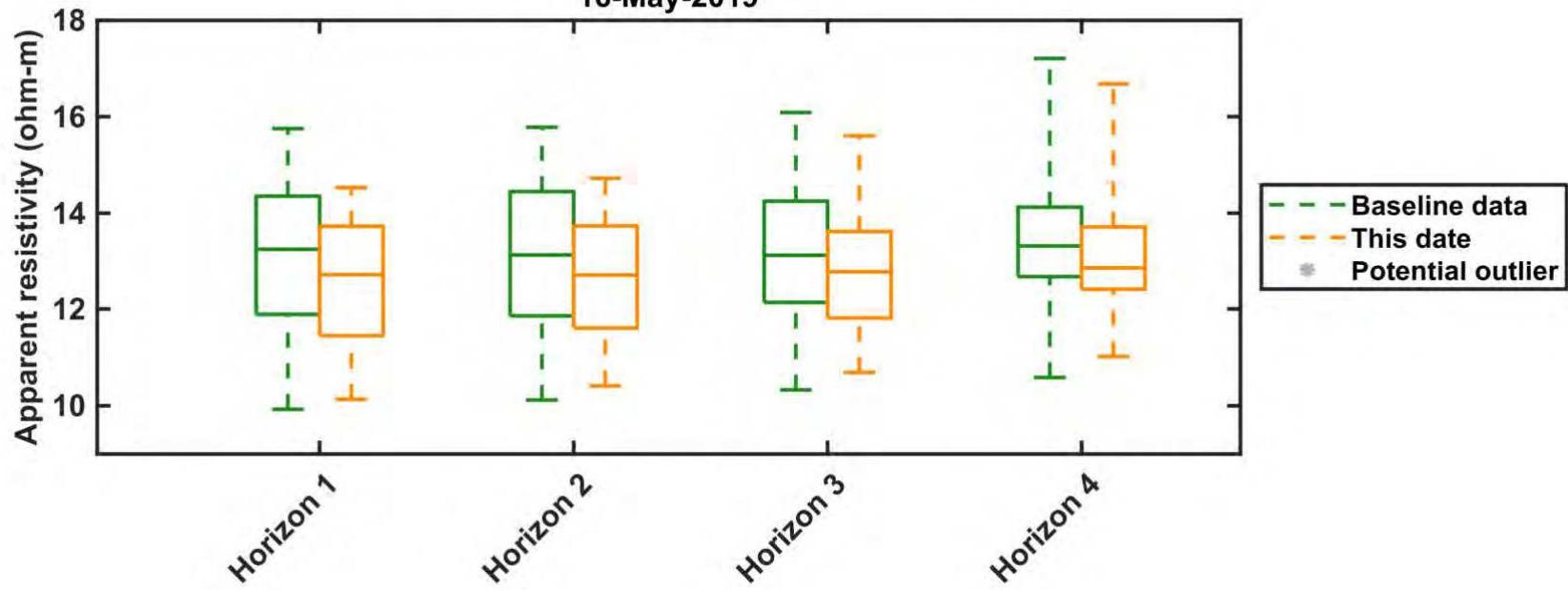
Florence electrical conductivity monitoring
02-May-2019



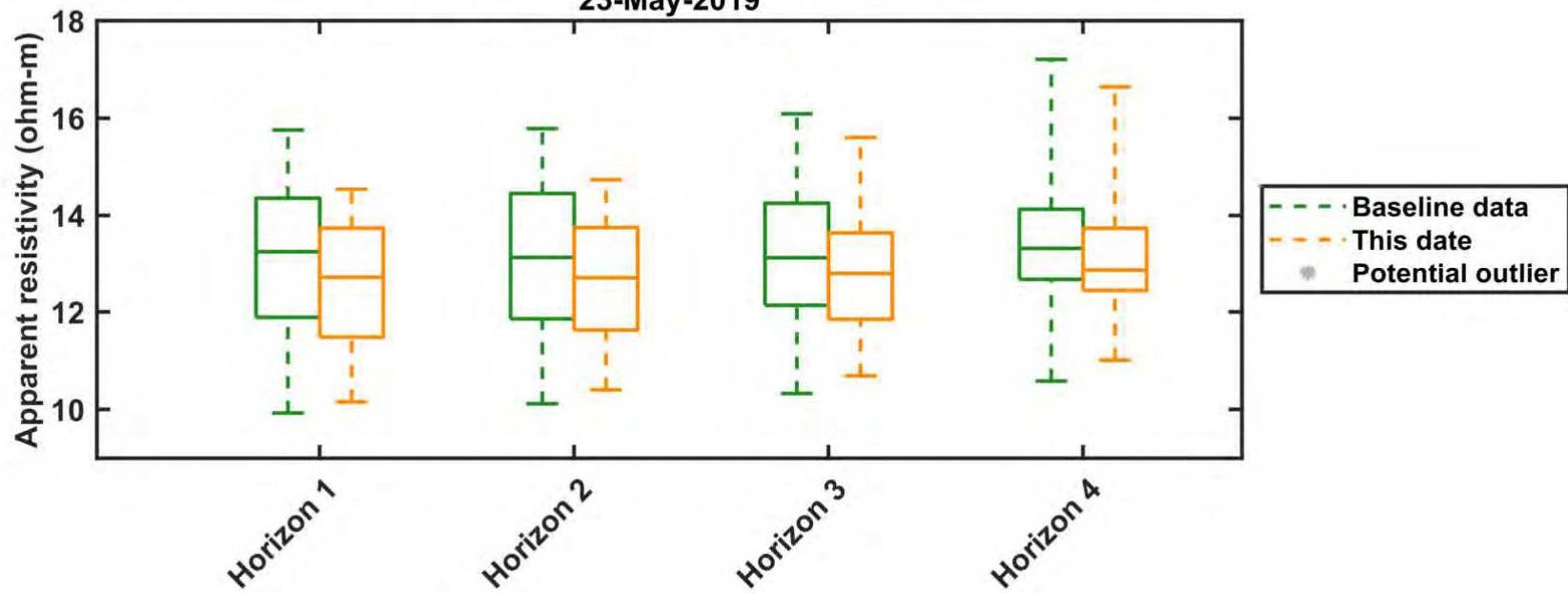
Florence electrical conductivity monitoring
09-May-2019



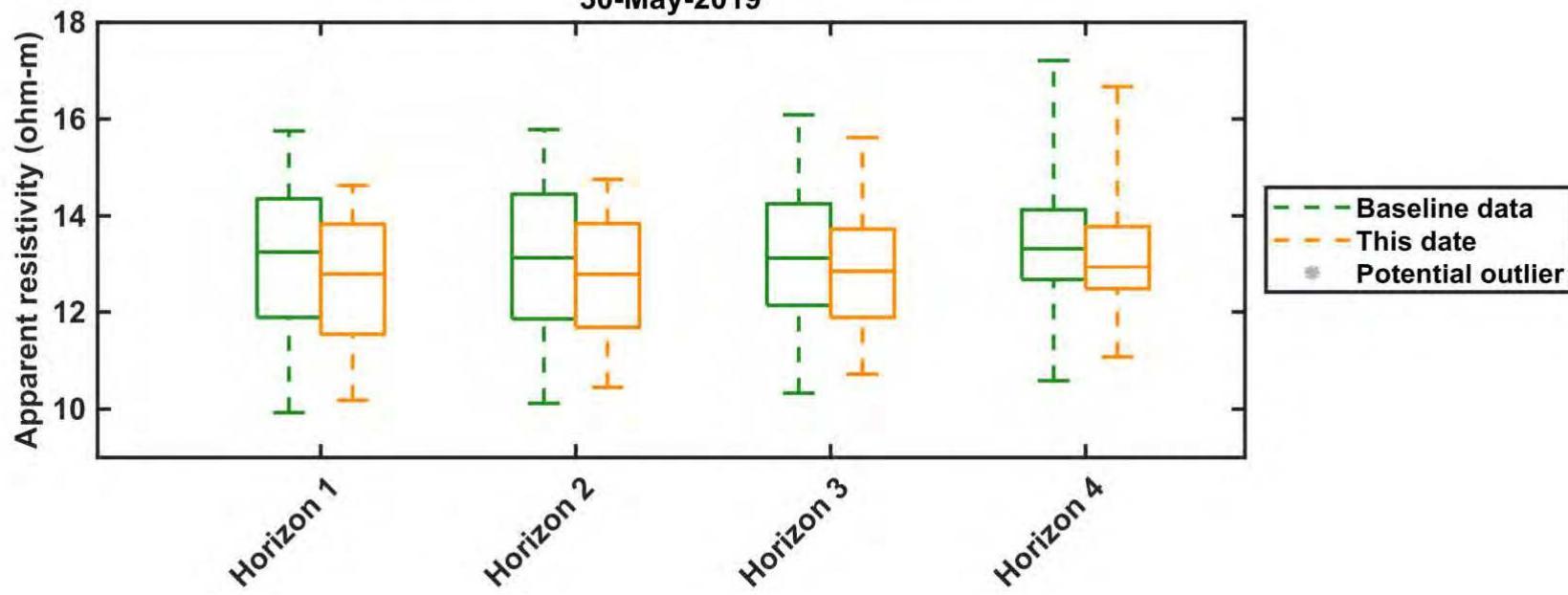
Florence electrical conductivity monitoring
16-May-2019



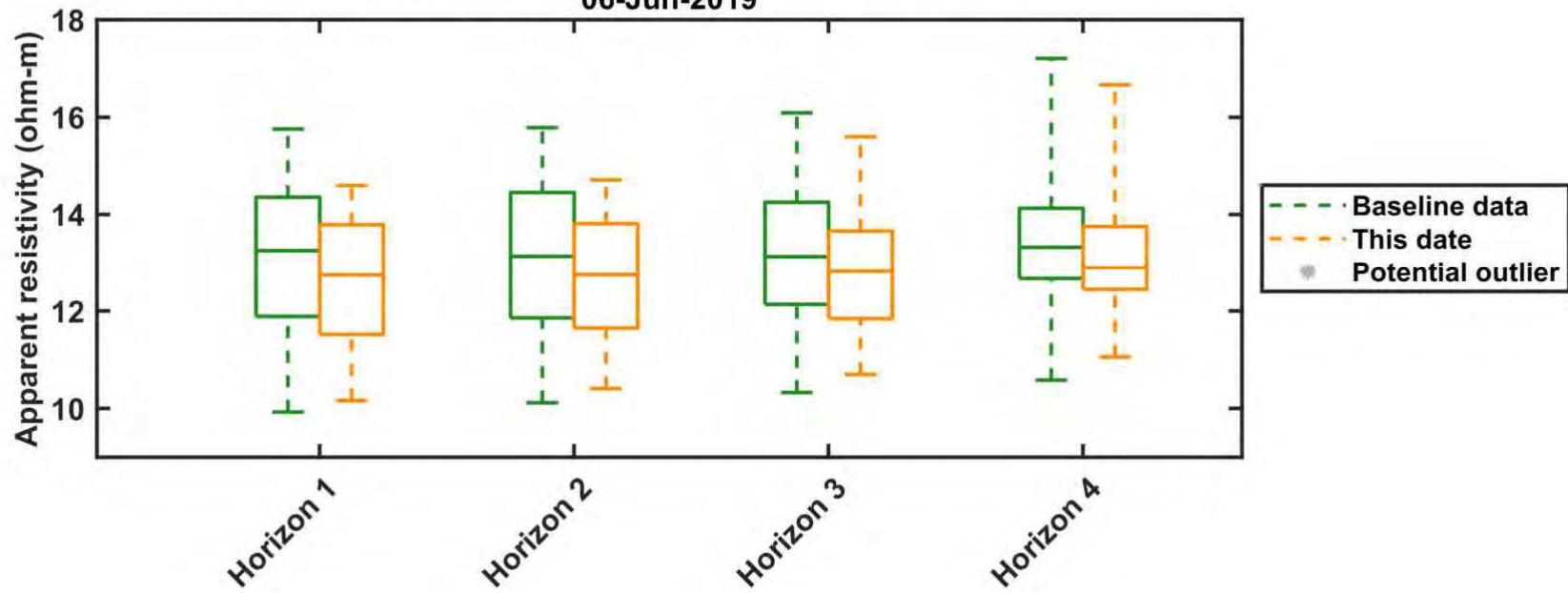
Florence electrical conductivity monitoring
23-May-2019



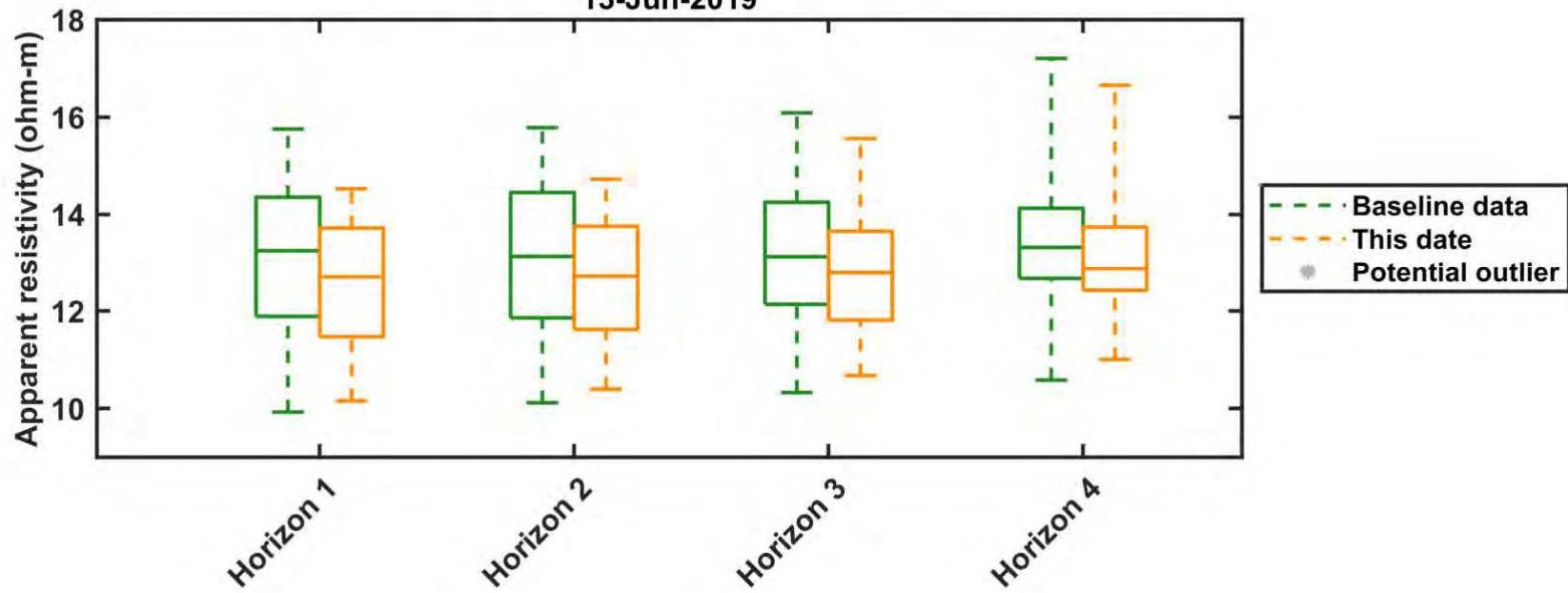
Florence electrical conductivity monitoring
30-May-2019



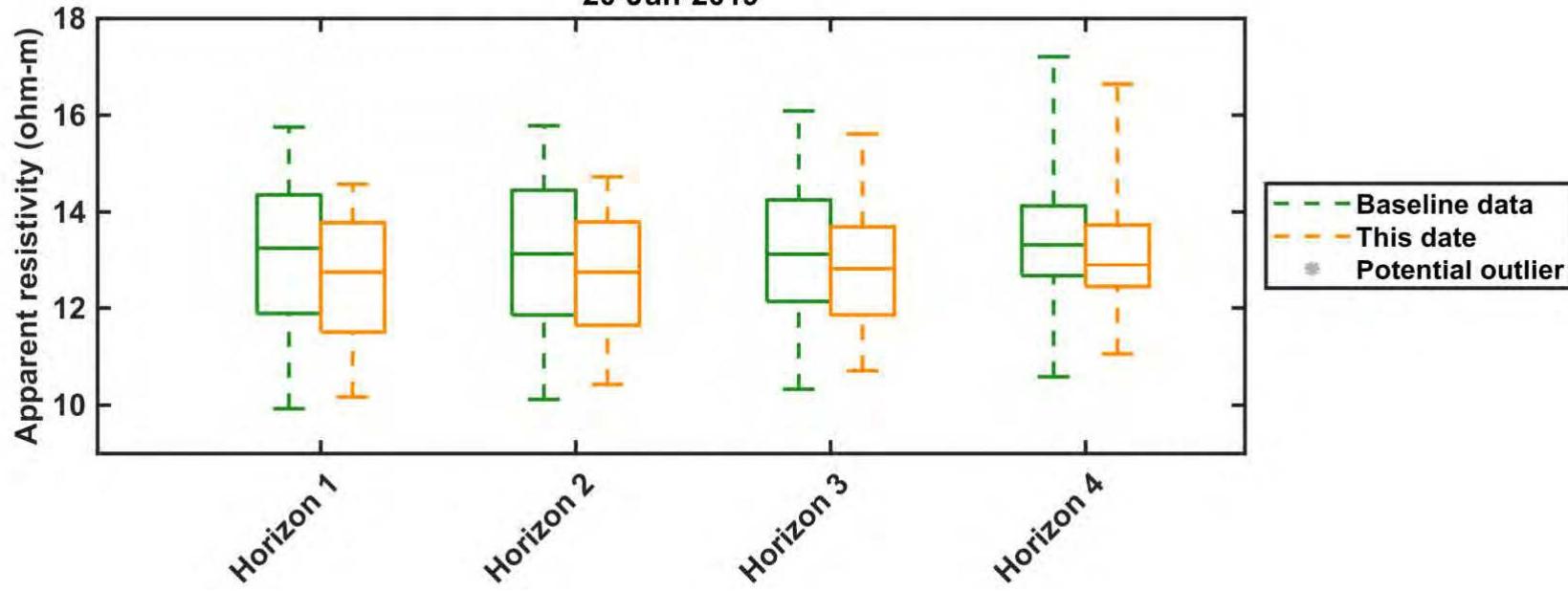
Florence electrical conductivity monitoring
06-Jun-2019



Florence electrical conductivity monitoring
13-Jun-2019



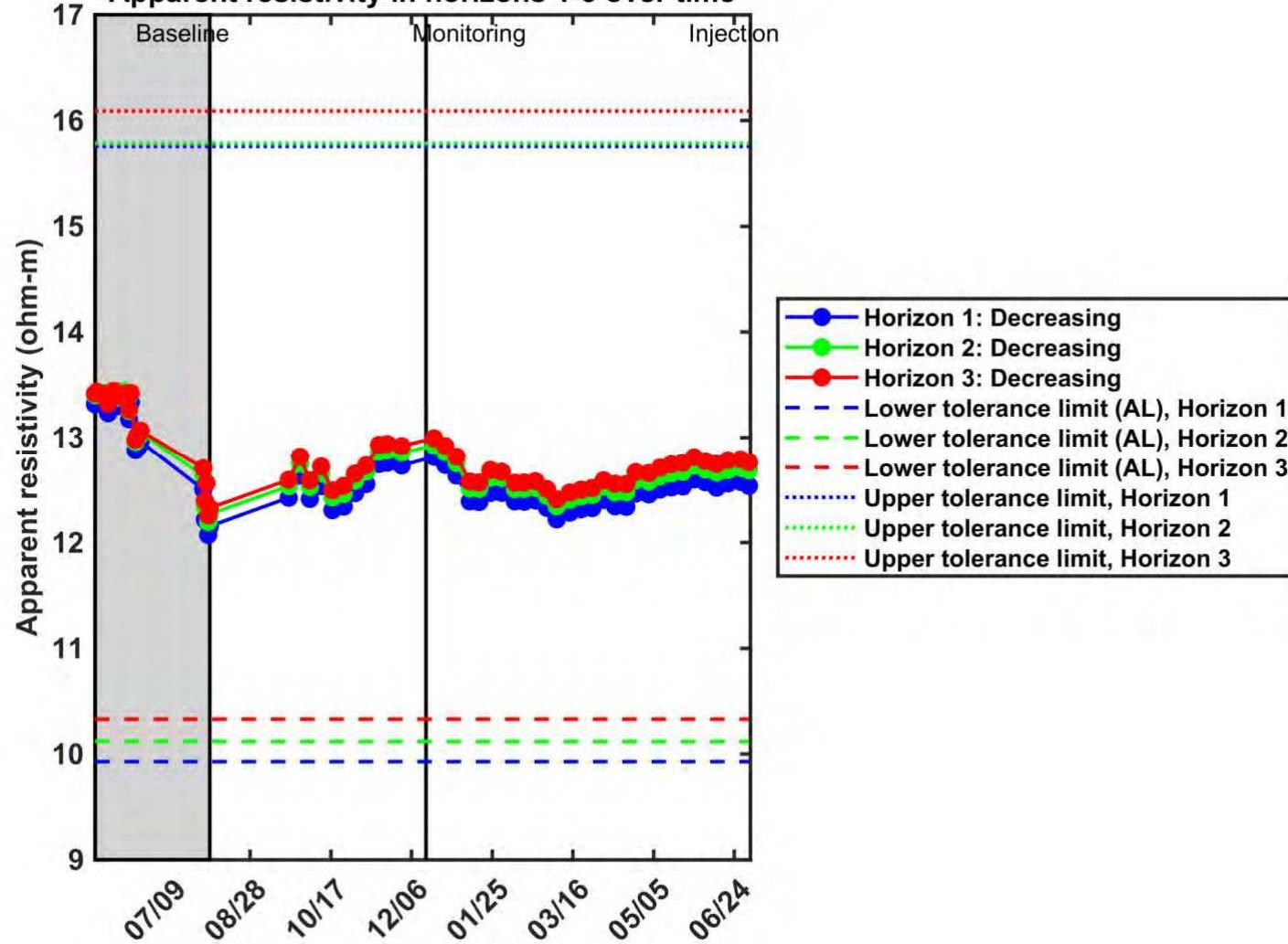
Florence electrical conductivity monitoring
20-Jun-2019



ATTACHMENT B

Summary Plot of Bulk Electrical Conductivity

Florence ambient electrical conductivity monitoring
Apparent resistivity in horizons 1-3 over time



ATTACHMENT 5

Pressure Transducer and Fracture Gradient Readings

Daily Wellhead Pressures - Injection Wells

Daily Wellhead Pressures - Injection Wells

Date	I-01			I-02			I-03			I-04			Fracture Gradient
	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	
5/27/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	112.90
5/28/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	112.90
5/29/2019	5.06	0.00	12.91	0.00	0.00	0.00	0.05	0.00	1.86	0.00	0.00	0.00	112.90
5/30/2019	2.55	0.00	11.73	0.00	0.00	0.00	0.03	0.00	2.50	0.00	0.00	0.00	112.90
5/31/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	112.90
6/1/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	112.90
6/2/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	112.90
6/3/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	112.90
6/4/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	112.90
6/5/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	112.90
6/6/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	112.90
6/7/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	112.90
6/8/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	112.90
6/9/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	112.90
6/10/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	112.90
6/11/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	112.90
6/12/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	112.90
6/13/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	112.90
6/14/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	112.90
6/15/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	112.90
6/16/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	112.90
6/17/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	112.90
6/18/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	112.90
6/19/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	112.90
6/20/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	112.90
6/21/2019	0.01	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	112.90
6/22/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	112.90
6/23/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	112.90
6/24/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	112.90
6/25/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	112.90
6/26/2019	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	112.90
6/27/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	112.90
6/28/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	112.90
6/29/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	112.90
6/30/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	112.90

All measurements in pounds per square inch (psi)

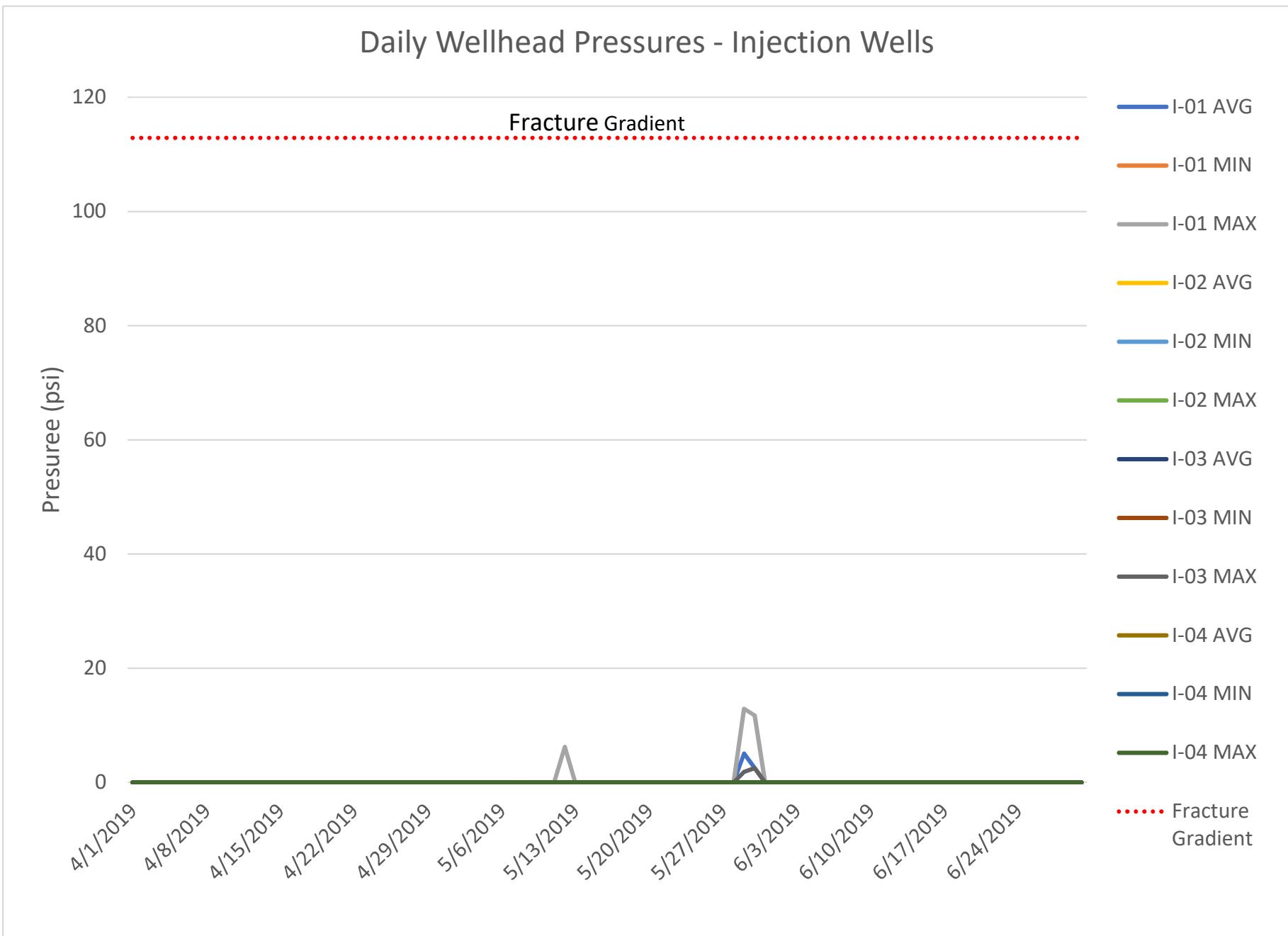
NM = Not measured or otherwise not available

Calculation of Pressure Allowed at the Wellhead from the Allowed Fracture Gradient

P-Wellhead = P-TOS - P-Col = [P-Frac x D-TOS] - [D-TOS / Conv] Where:

P-Fracture	= Pressure allowed at the top of the injection well screen (TOS)	=	0.65	psi/foot of depth
D-TOS	= Depth to top of injection well screens	=	520	feet
P-TOS	= Total pressure allowed at top of screen = P-Fracture x D-TOS	= 0.65 psi/foot x 520 feet	338	psi
Conv	= Feet of Water per psi	=	2.31	feet/psi
P-Col	= Pressure from weight of water column at TOS	= 520 feet / 2.31 feet/psi	225.11	psi
P-Wellhead	= Allowable pressure at the top of the wellhead = P-TOS - P-Col	= 338 psi - 225.11 psi	112.89	psi

Injection well I-01 pressure transducers indicated wellhead max pressures of: 0.3 and 6.23 psi on May 11 and 12; 12.91 and 11.73 on May 29 and 30; and 0.04 on June 21 and 26. I-03 wellhead pressures were noted on May 12: 0.01 psi; and May 29 and 30: 1.86 and 2.50 psi. The remaining wellhead pressures were zero.



Daily Casing Annulus Pressures - Injection Wells

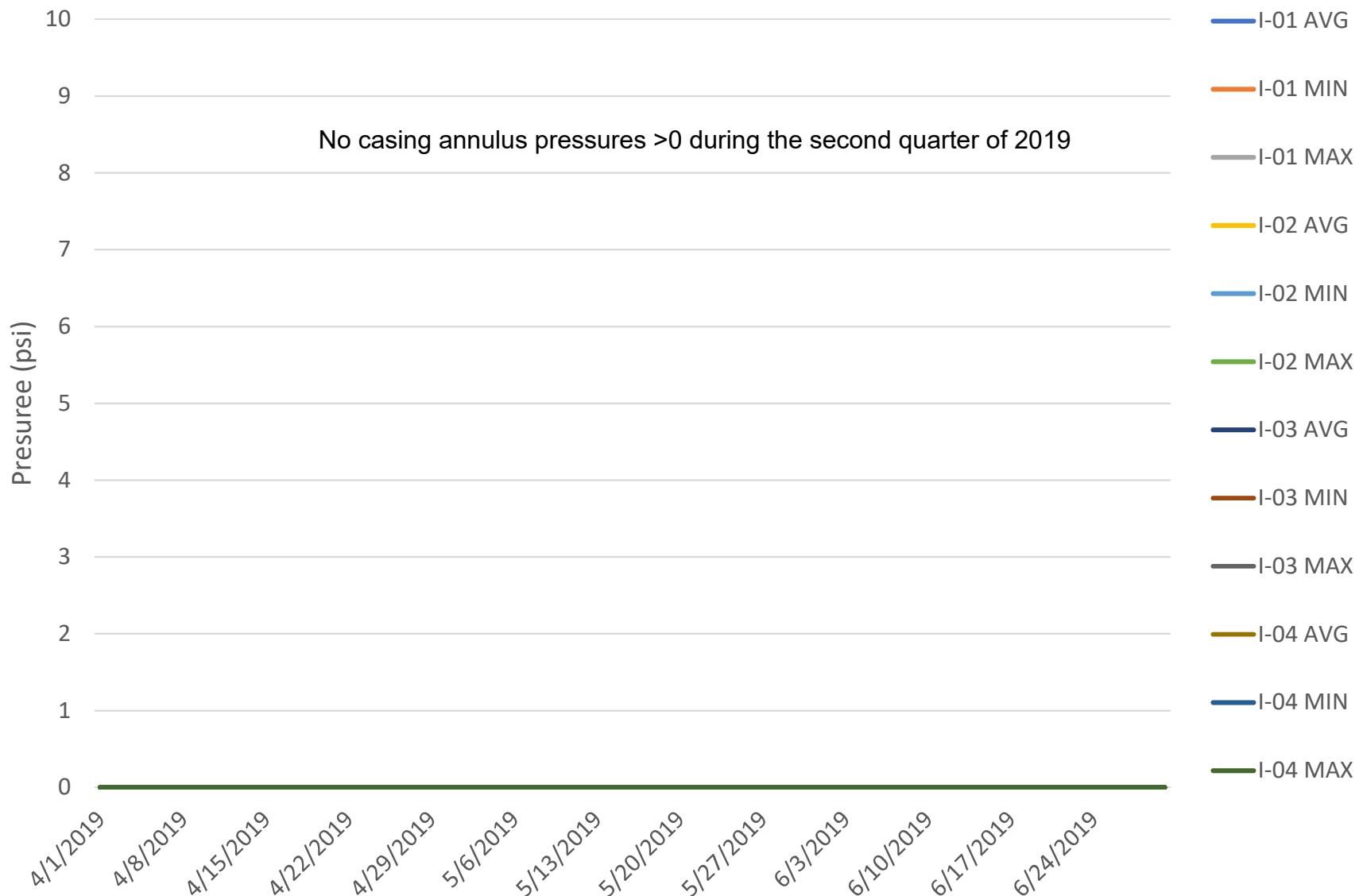
Daily Casing Annulus Pressures - Injection Wells

Date	I-01			I-02			I-03			I-04		
	Avg	Min	Max									
5/20/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5/21/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5/22/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5/23/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5/24/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5/25/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5/26/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5/27/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5/28/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5/29/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5/30/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5/31/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6/1/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6/2/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6/3/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6/4/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6/5/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6/6/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6/7/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6/8/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6/9/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6/10/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6/11/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6/12/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6/13/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6/14/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6/15/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6/16/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6/17/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6/18/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6/19/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6/20/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6/21/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6/22/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6/23/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6/24/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6/25/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6/26/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6/27/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6/28/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6/29/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6/30/2019	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

All measurements in pounds per square inch (psi)

There were no casing annulus pressures >0 during the second quarter of 2019

Daily Casing Annulus Pressures - Injection Wells



ATTACHMENT 6

Fluid Electroconductivity Readings from Injection and Observations Wells

Daily Fluid Electrical Conductivity - Injection and Observation Wells

Date	I-01	I-02	I-03	I-04	O-01	O-02	O-03	O-04	O-05	O-06	O-07
4/1/2019	43,193	43,282	43,261	43,291	2,459	2,125	1,674	2,468	1,470	1,498	1,517
4/2/2019	51,028	51,654	51,623	51,848	2,399	2,082	1,766	2,580	1,516	1,511	1,535
4/3/2019	48,757	48,612	48,930	48,821	2,292	1,922	1,673	2,474	1,470	1,415	1,434
4/4/2019	50,702	50,807	50,170	50,493	2,647	2,176	1,955	2,755	1,610	1,631	1,649
4/5/2019	50,577	50,292	49,535	50,729	2,492	1,993	1,880	2,677	1,888	1,536	1,559
4/6/2019	42,161	41,999	42,135	42,372	2,748	2,119	2,064	2,954	1,724	1,663	1,677
4/7/2019	47,891	47,781	47,679	47,904	2,172	1,701	1,692	2,306	1,364	1,349	1,363
4/8/2019	45,239	45,128	44,981	45,331	2,430	1,939	1,964	2,322	1,434	1,504	1,495
4/9/2019	47,313	47,146	47,148	47,218	2,283	2,229	1,856	2,044	1,366	1,258	1,374
4/10/2019	49,567	49,095	49,110	49,339	2,429	2,225	1,746	2,025	1,275	1,341	1,350
4/11/2019	51,099	51,061	50,053	51,122	2,438	2,016	1,787	2,059	1,346	1,321	1,344
4/12/2019	48,550	48,806	48,762	48,913	2,210	1,766	2,194	2,071	1,257	1,322	1,341
4/13/2019	51,090	51,271	50,241	50,636	2,710	2,105	3,051	2,712	1,707	1,655	1,611
4/14/2019	51,024	49,560	50,962	50,778	2,679	2,048	3,067	2,644	1,590	1,590	1,625
4/15/2019	46,880	46,869	47,028	47,280	2,527	2,454	3,197	2,616	1,526	1,562	1,581
4/16/2019	50,018	50,578	51,068	51,022	2,757	2,798	3,276	2,617	1,643	1,616	1,660
4/17/2019	49,964	49,990	49,958	49,875	2,859	2,657	3,238	2,409	1,616	1,649	1,899
4/18/2019	49,453	49,319	49,368	49,488	3,007	2,766	2,433	1,611	1,568	2,230	3,467
4/19/2019	46,734	46,617	46,221	46,913	3,318	2,789	2,172	1,675	1,555	2,543	3,754
4/20/2019	46,859	47,118	47,534	47,174	3,100	2,541	2,177	1,638	1,472	2,350	3,106
4/21/2019	47,905	47,252	47,483	48,048	3,129	2,534	1,981	1,742	1,435	2,286	3,040
4/22/2019	46,072	46,096	46,464	46,124	3,151	2,593	2,614	1,962	1,645	2,123	3,103
4/23/2019	45,668	45,115	45,234	44,527	3,034	2,147	1,462	2,260	2,635	2,618	3,250
4/24/2019	47,065	46,587	46,866	47,762	3,091	2,499	2,688	2,151	1,350	2,094	2,446
4/25/2019	44,519	44,328	44,017	45,167	2,845	2,259	2,745	2,810	1,313	1,877	2,105
4/26/2019	46,460	46,035	45,863	46,598	3,415	2,724	3,518	3,159	1,566	2,171	2,227
4/27/2019	48,047	48,084	48,235	48,227	3,130	2,159	3,080	2,848	1,381	1,930	1,400
4/28/2019	46,892	46,843	46,881	46,964	3,172	1,568	3,044	2,911	1,386	1,921	1,372
4/29/2019	47,944	47,938	48,368	47,490	2,999	1,452	2,919	2,706	1,288	1,753	1,315
4/30/2019	46,561	47,254	46,935	47,131	3,114	1,474	2,940	2,848	1,016	1,405	1,042
5/1/2019	47,458	47,514	47,507	47,535	3,192	1,399	2,866	2,967	1,309	1,381	1,358
5/2/2019	49,259	49,420	49,804	49,184	3,173	1,402	3,141	2,821	1,348	1,356	1,543
5/3/2019	48,514	48,259	47,932	48,449	3,959	2,577	3,769	3,455	1,833	1,669	1,843
5/4/2019	48,525	49,104	49,172	48,617	3,638	2,064	2,973	2,996	1,483	1,464	1,496
5/5/2019	47,092	46,611	47,240	46,481	3,674	1,722	3,191	3,052	1,472	1,507	2,440
5/6/2019	47,592	47,834	47,429	47,681	3,527	1,630	3,362	3,021	1,410	1,465	1,662
5/7/2019	50,306	49,873	49,876	49,945	3,631	1,484	3,517	2,906	1,418	1,467	1,966
5/8/2019	48,218	47,893	47,769	47,934	3,584	1,542	3,480	2,815	1,444	1,460	1,472
5/9/2019	48,219	48,100	48,063	48,022	3,761	1,700	3,846	2,966	1,555	1,578	1,555
5/10/2019	48,674	48,200	48,561	47,932	3,633	1,481	3,888	2,782	1,459	1,551	1,517
5/11/2019	48,702	48,823	48,874	48,797	3,627	1,475	2,937	3,079	1,494	1,491	1,463
5/12/2019	47,787	48,826	47,971	47,910	3,441	1,248	3,079	2,911	1,614	1,372	1,369
5/13/2019	48,387	46,956	47,763	46,570	3,820	1,676	3,956	3,444	1,478	1,608	1,553
5/14/2019	46,289	45,633	46,470	46,739	3,838	1,977	3,899	3,229	1,483	1,538	1,516
5/15/2019	50,429	50,389	50,497	50,506	3,911	2,464	3,952	3,030	1,506	1,518	1,505
5/16/2019	47,627	47,583	47,989	47,344	4,040	1,517	3,923	3,008	1,484	1,559	1,527

Daily Fluid Electrical Conductivity - Injection and Observation Wells

Date	I-01	I-02	I-03	I-04	O-01	O-02	O-03	O-04	O-05	O-06	O-07
5/17/2019	46,851	47,317	46,506	48,116	4,489	1,538	4,253	3,318	1,639	1,701	1,645
5/18/2019	48,411	48,397	48,467	48,410	4,034	2,102	3,835	2,961	1,551	1,578	1,500
5/19/2019	48,150	48,090	48,165	48,810	3,946	1,739	3,798	3,057	1,441	1,474	1,460
5/20/2019	47,293	47,406	47,415	47,379	4,504	1,952	4,394	3,193	1,596	1,720	2,074
5/21/2019	49,027	48,809	48,882	48,969	4,156	1,902	4,154	3,434	1,529	1,636	1,976
5/22/2019	49,485	49,509	49,481	49,521	4,133	1,412	3,975	3,325	1,652	1,566	1,579
5/23/2019	50,221	50,188	50,239	50,039	4,522	2,468	4,415	3,484	1,630	1,625	1,651
5/24/2019	42,522	42,478	42,539	42,441	4,616	2,356	4,530	3,435	1,649	1,670	1,660
5/25/2019	48,267	43,052	43,076	42,967	3,982	2,231	3,918	2,914	1,384	1,448	1,835
5/26/2019	41,804	41,555	41,705	42,370	4,528	2,380	4,364	3,374	1,556	1,574	2,182
5/27/2019	48,905	48,918	49,019	49,047	4,823	2,972	4,348	3,816	2,158	1,793	2,226
5/28/2019	49,096	49,042	49,008	48,880	4,161	2,100	4,157	3,308	1,458	1,479	2,106
5/29/2019	49,727	49,690	49,716	49,566	4,229	1,508	4,174	3,286	1,466	1,498	1,706
5/30/2019	#N/A	#N/A	#N/A	#N/A	4,750	2,089	1,716	1,688	1,657	1,644	1,662
5/31/2019	48,804	48,933	#N/A	48,127	4,242	2,112	1,610	1,687	1,479	1,510	1,543
6/1/2019	38,835	39,840	40,137	39,275	4,403	2,166	1,640	1,755	1,565	1,590	1,597
6/2/2019	51,501	52,929	51,819	51,647	4,209	2,432	2,525	1,613	1,510	1,509	1,531
6/3/2019	44,976	44,447	44,261	44,350	4,725	3,059	3,142	1,758	1,639	1,723	1,688
6/4/2019	49,654	48,634	48,560	49,319	4,604	3,014	1,858	1,742	1,616	1,672	1,666
6/5/2019	48,373	47,646	47,575	48,068	4,648	2,963	3,663	2,010	1,645	1,650	1,652
6/6/2019	46,498	46,041	46,148	41,295	5,122	3,106	4,586	2,170	1,778	1,793	1,801
6/7/2019	46,507	46,911	46,505	46,939	4,635	2,868	4,465	2,179	1,619	1,652	1,635
6/8/2019	47,828	47,932	47,808	47,697	4,578	2,760	4,586	2,097	1,612	1,642	1,621
6/9/2019	48,800	48,787	49,079	48,758	4,660	2,759	4,702	2,222	1,636	1,679	1,634
6/10/2019	49,156	47,917	48,252	47,988	4,758	2,701	4,692	2,182	1,688	1,720	1,676
6/11/2019	46,649	46,987	46,972	48,093	4,966	2,689	5,182	2,457	1,682	1,712	1,686
6/12/2019	49,475	50,170	49,976	50,333	4,517	2,052	4,414	2,781	1,470	1,539	2,139
6/13/2019	50,210	50,269	50,103	50,209	4,378	2,026	4,378	2,933	1,448	1,513	1,954
6/14/2019	49,863	49,569	49,582	49,559	4,772	2,182	4,652	3,072	1,553	1,826	2,187
6/15/2019	47,784	48,256	48,065	48,295	5,087	2,368	4,973	3,238	1,640	1,651	2,627
6/16/2019	47,769	47,733	47,824	47,644	4,354	2,336	4,016	2,988	1,378	1,496	2,253
6/17/2019	47,837	47,803	48,169	47,850	4,197	2,031	4,154	2,750	1,367	1,348	2,309
6/18/2019	48,538	48,529	48,461	48,569	4,893	2,295	4,873	3,266	1,542	1,589	2,806
6/19/2019	47,769	47,694	47,741	47,766	4,478	2,201	4,346	3,430	1,423	1,421	2,432
6/20/2019	46,665	47,496	47,745	47,024	4,426	2,173	4,364	2,993	1,364	1,432	2,571
6/21/2019	58,541	58,856	58,866	58,947	5,263	2,553	5,104	3,851	1,582	1,624	3,038
6/22/2019	48,034	48,270	46,925	47,586	5,275	2,458	5,119	3,772	1,622	1,677	3,179
6/23/2019	48,183	47,782	47,937	47,966	5,277	2,713	5,153	3,777	1,674	1,725	3,363
6/24/2019	45,303	44,823	44,763	44,530	5,307	2,999	5,234	3,874	1,678	1,803	3,400
6/25/2019	#N/A	47,943	48,215	48,376	5,276	2,711	4,989	3,919	1,811	1,717	3,127
6/26/2019	46,837	47,642	46,966	47,181	4,794	2,725	4,761	3,543	1,499	1,556	3,181
6/27/2019	48,615	48,796	49,423	49,189	5,300	2,892	5,266	3,651	1,646	1,761	3,352
6/28/2019	46,915	46,864	46,848	47,001	5,080	2,762	5,070	3,491	1,545	1,689	3,342
6/29/2019	48,152	47,290	47,397	47,816	5,162	2,750	5,113	3,489	1,549	1,683	3,338
6/30/2019	47,761	47,747	47,666	47,690	5,072	2,715	5,034	3,488	1,559	1,659	3,327

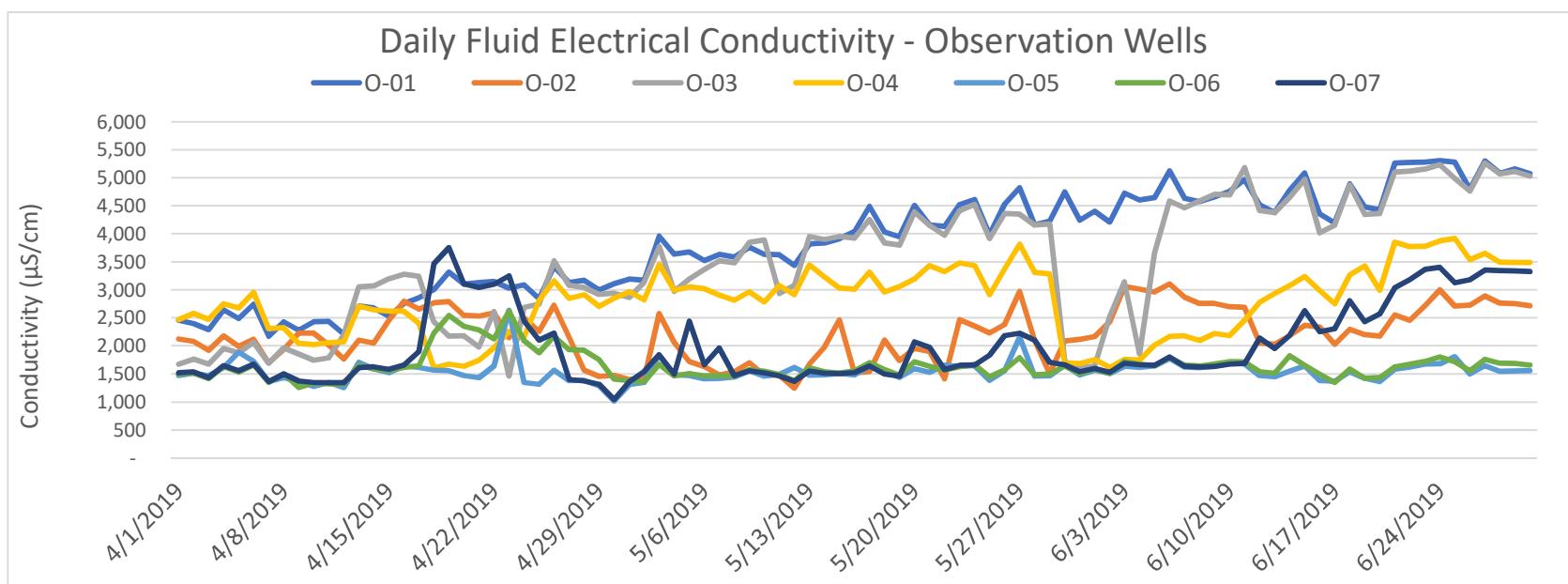
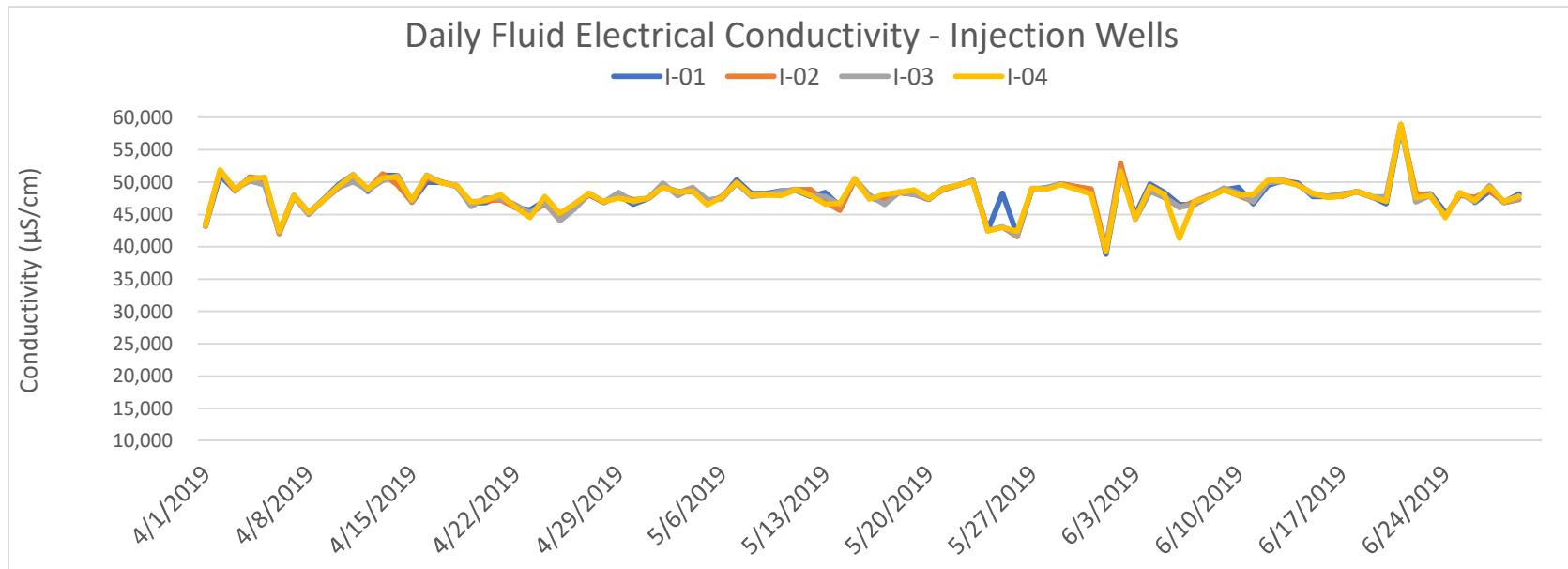
All measurements in microsemens per centimeter ($\mu\text{s}/\text{cm}$)

#NA or NM = Not measured or otherwise not available

5/30 No samples: Injection wells were off for routine pipeline maintenance

5/31 No sample: I-03. Well was off during sampling.

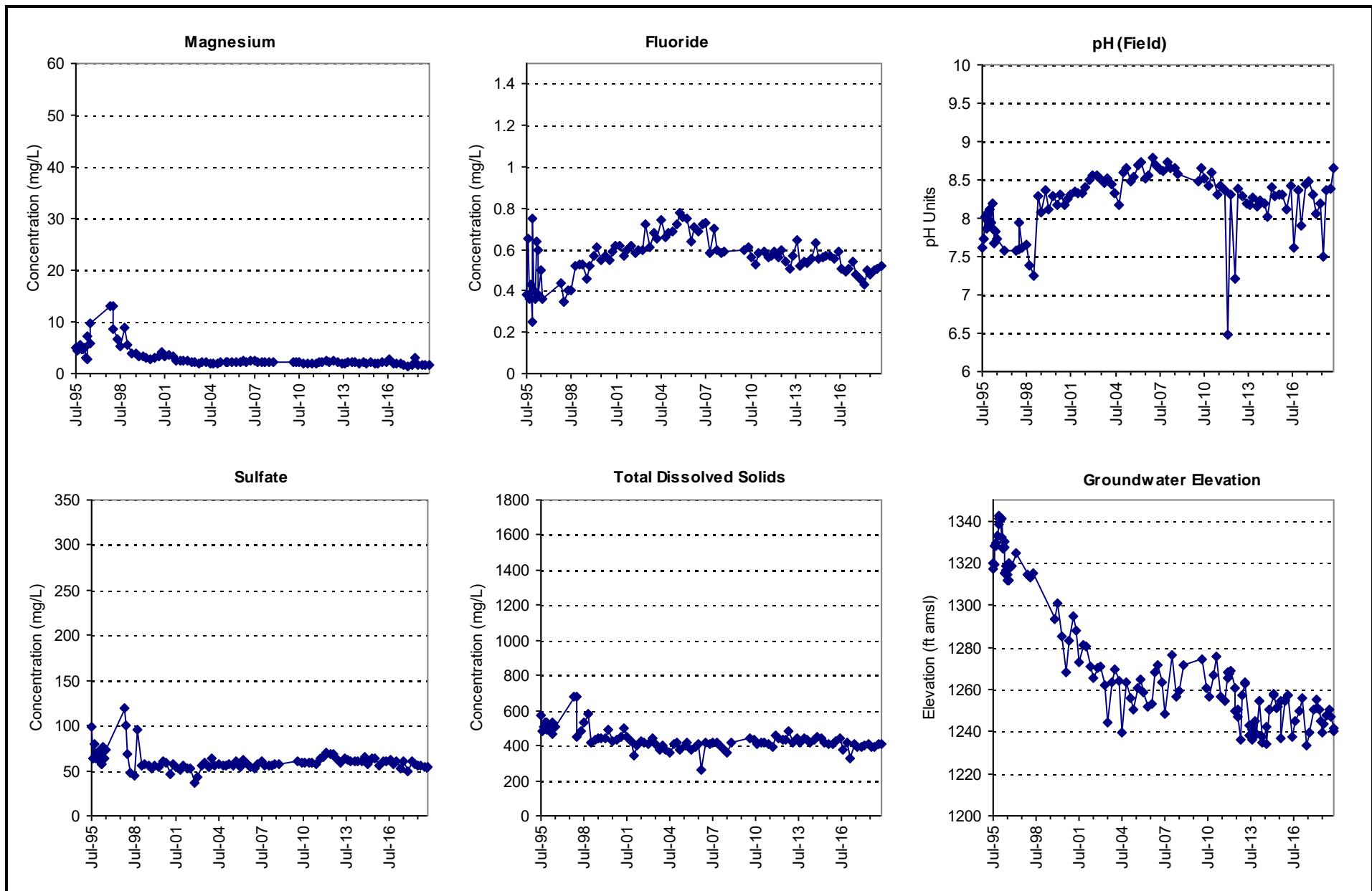
6/25 No sample: I-01.



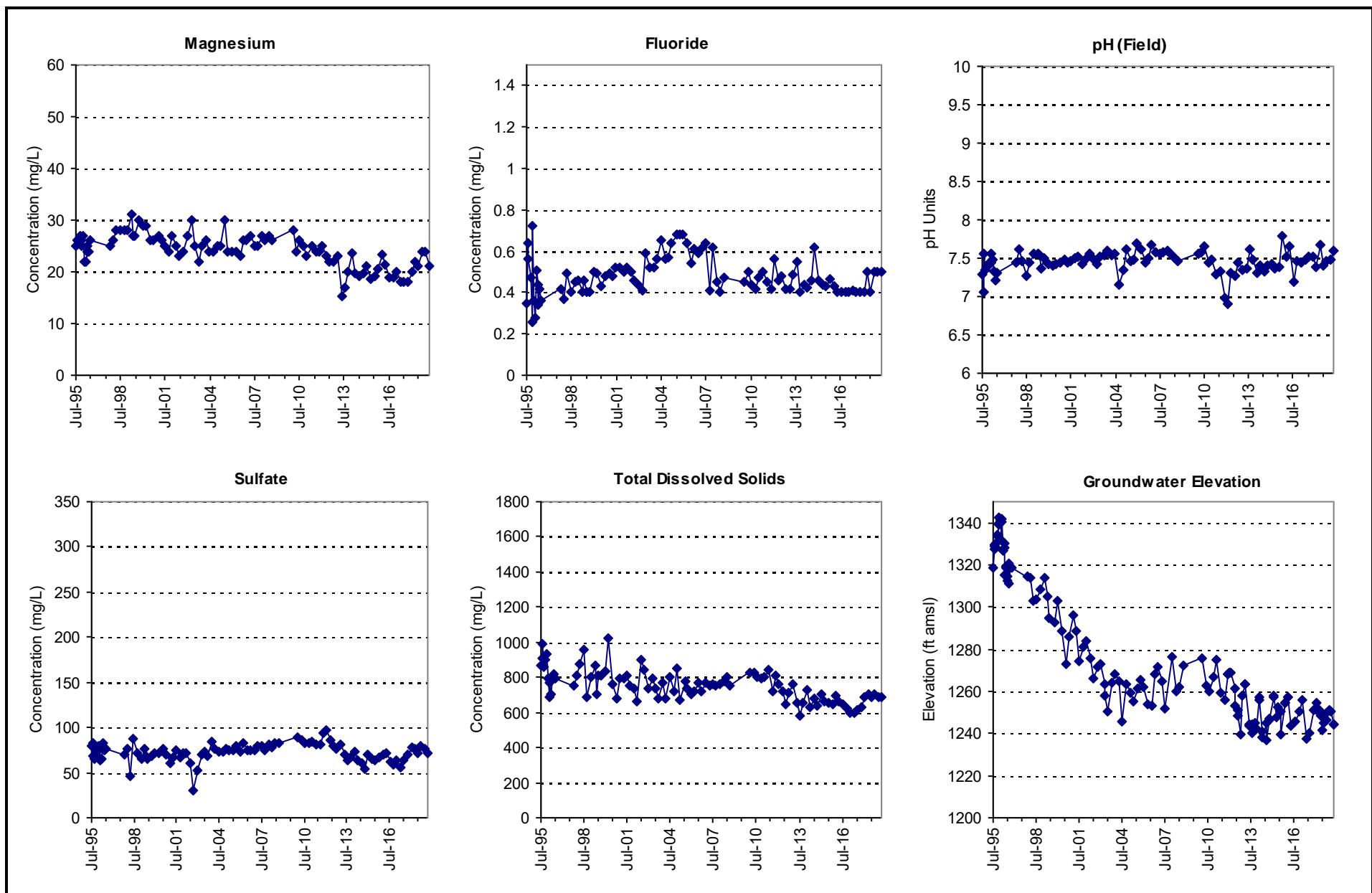
ATTACHMENT 7

Time versus Concentration Plots of Select Groundwater Parameters

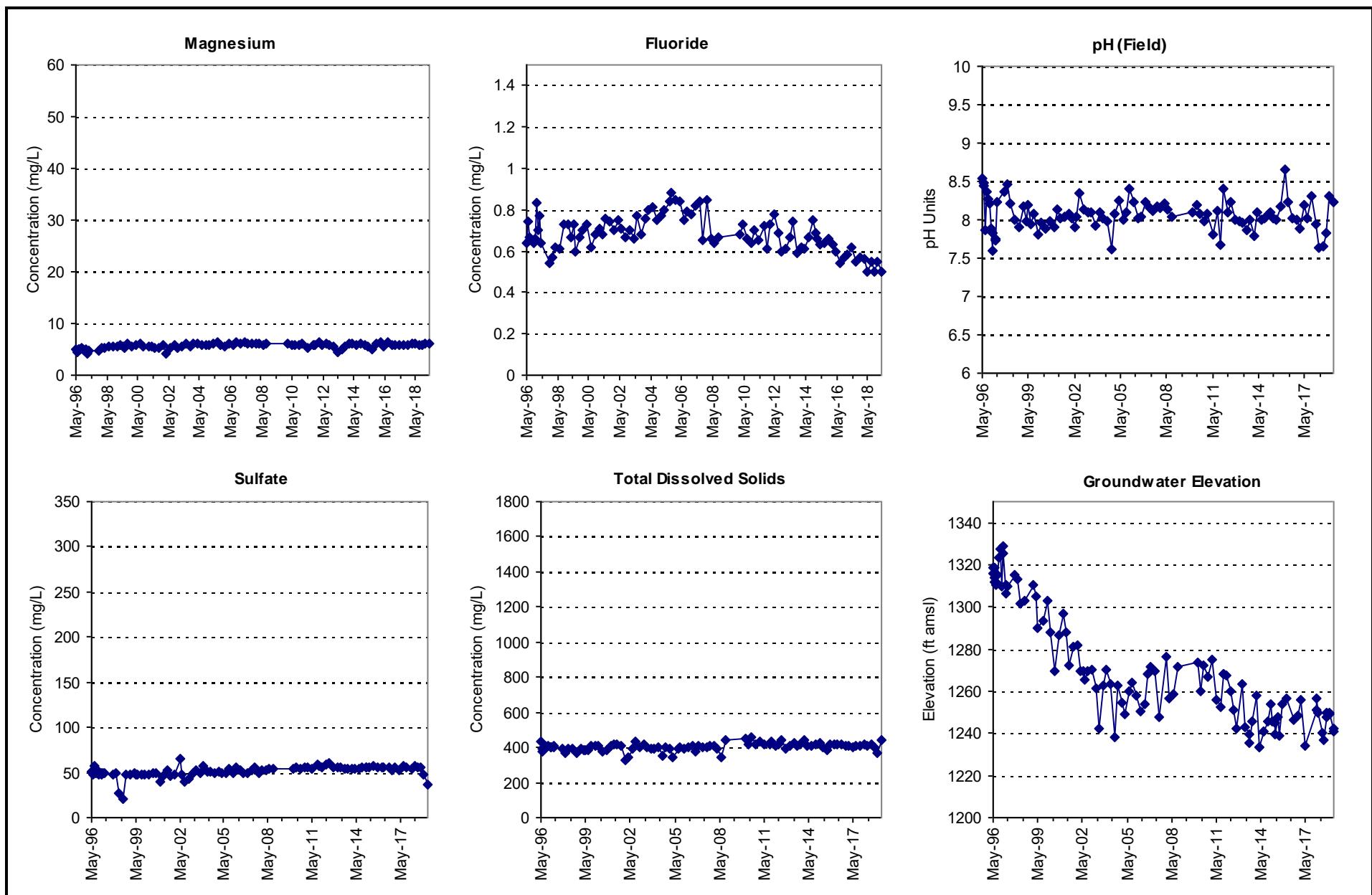
M14-GL Quarterly Concentration Graphs



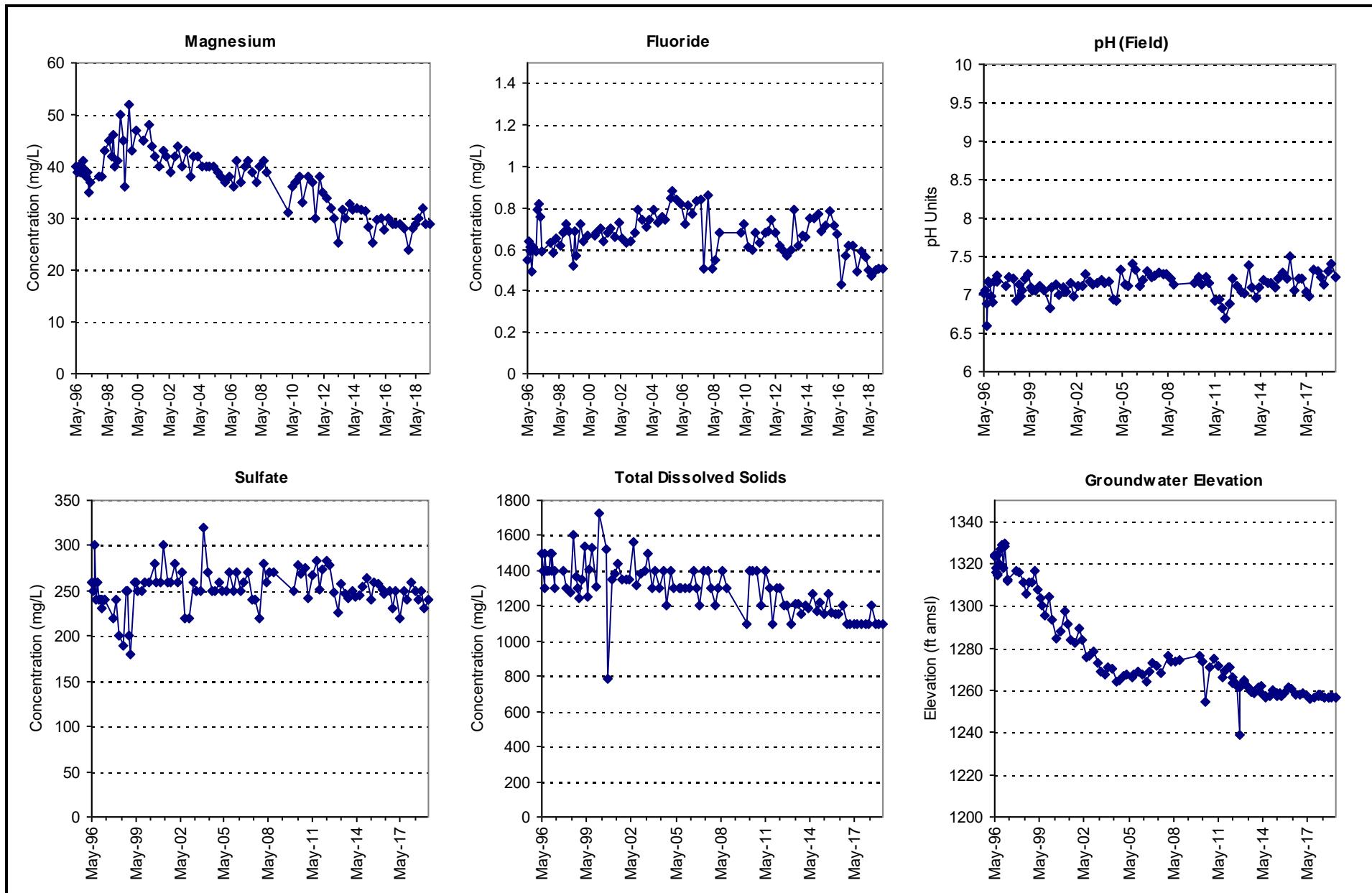
M15-GU Quarterly Concentration Graphs



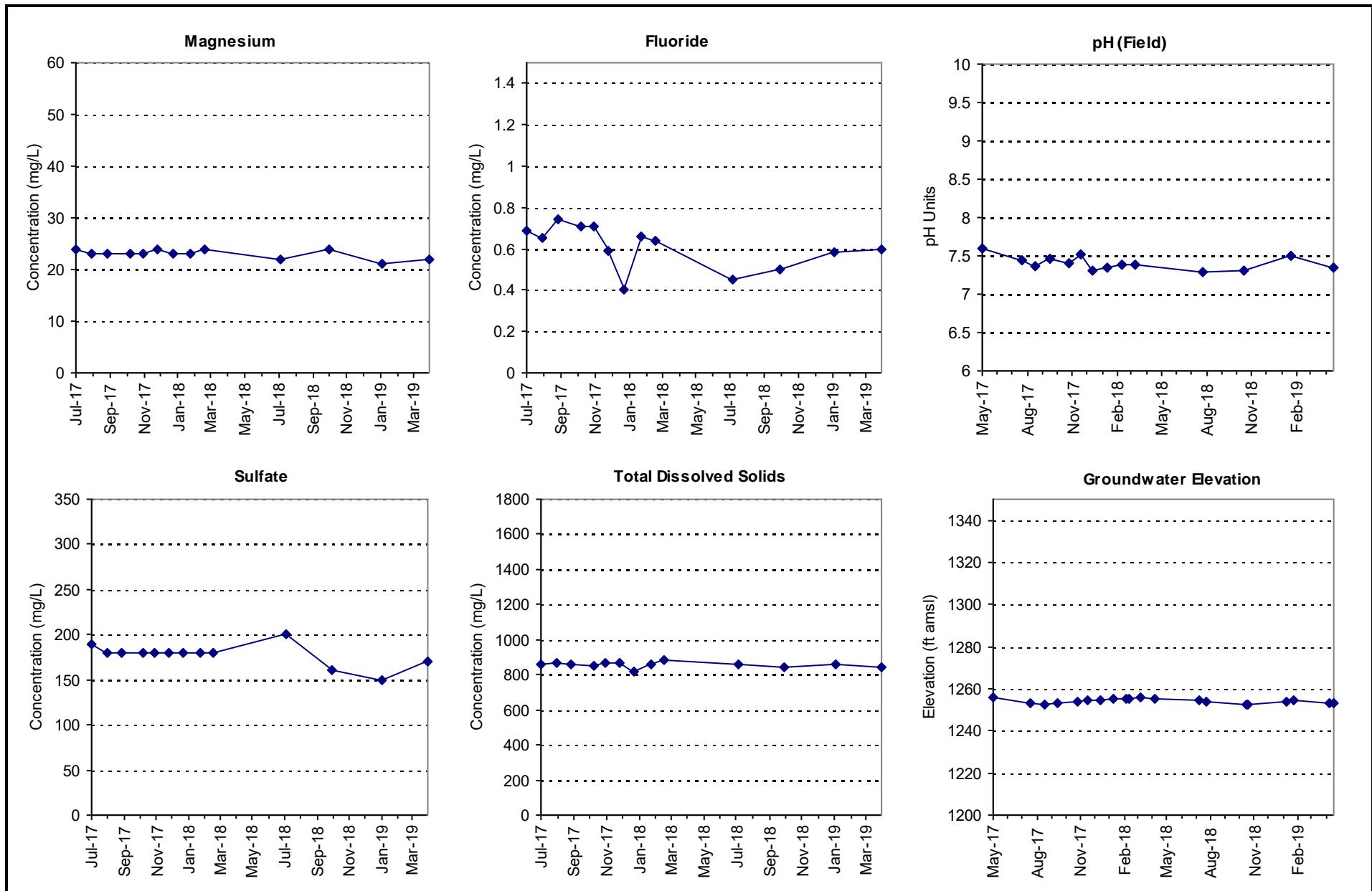
M22-O Quarterly Concentration Graphs



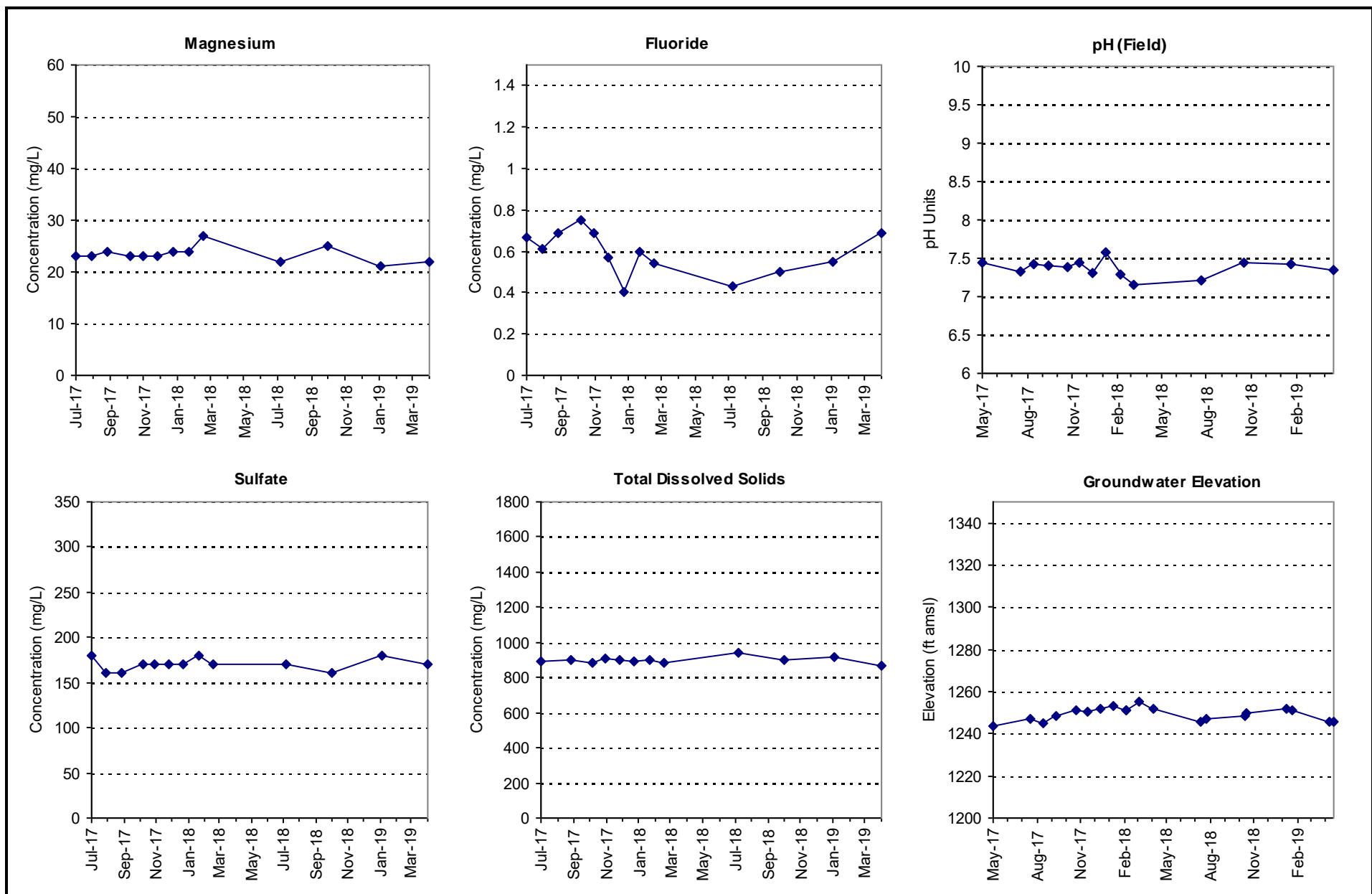
M23-UBF Quarterly Concentration Graphs



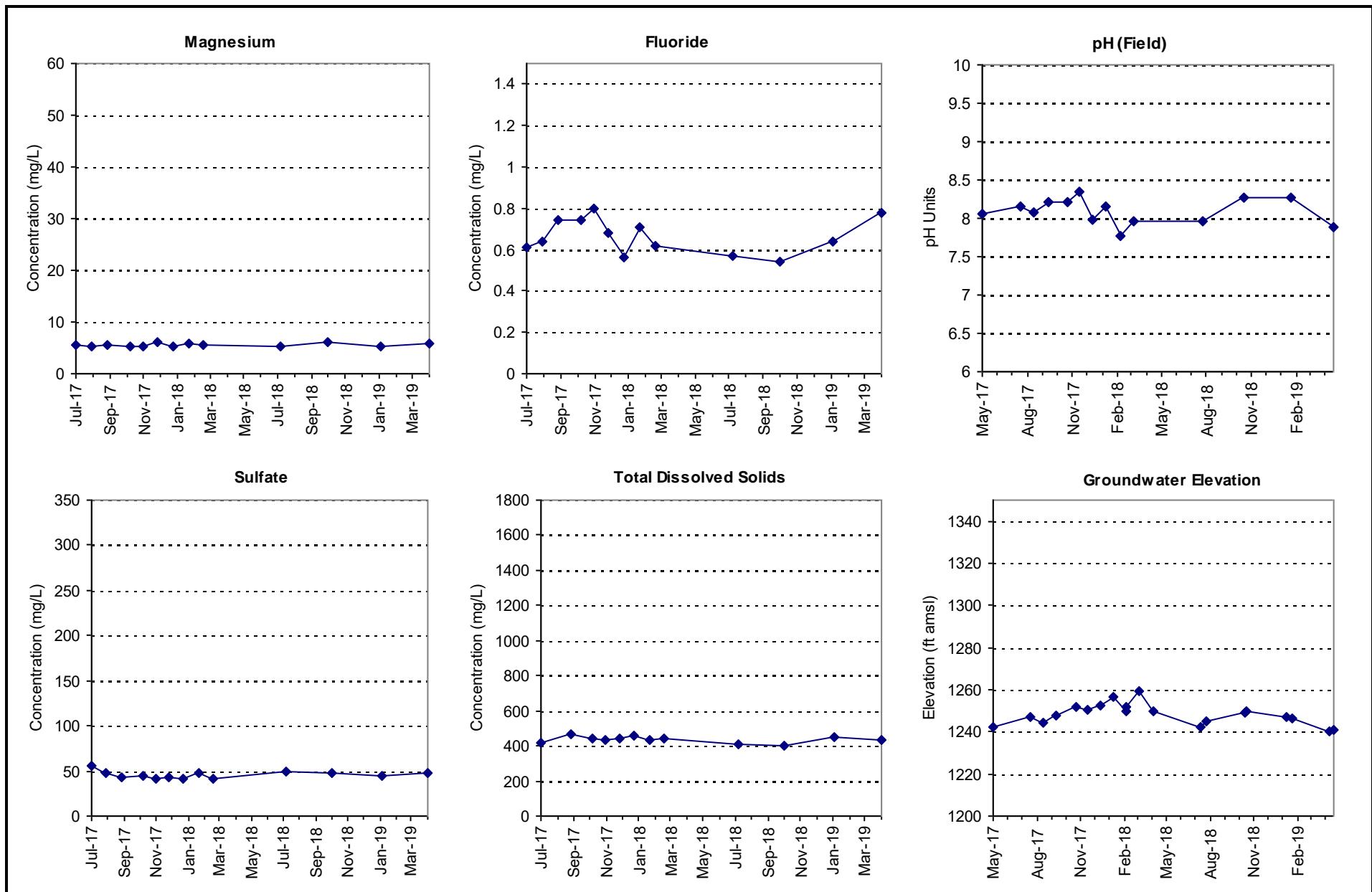
M52-UBF Quarterly Concentration Graphs



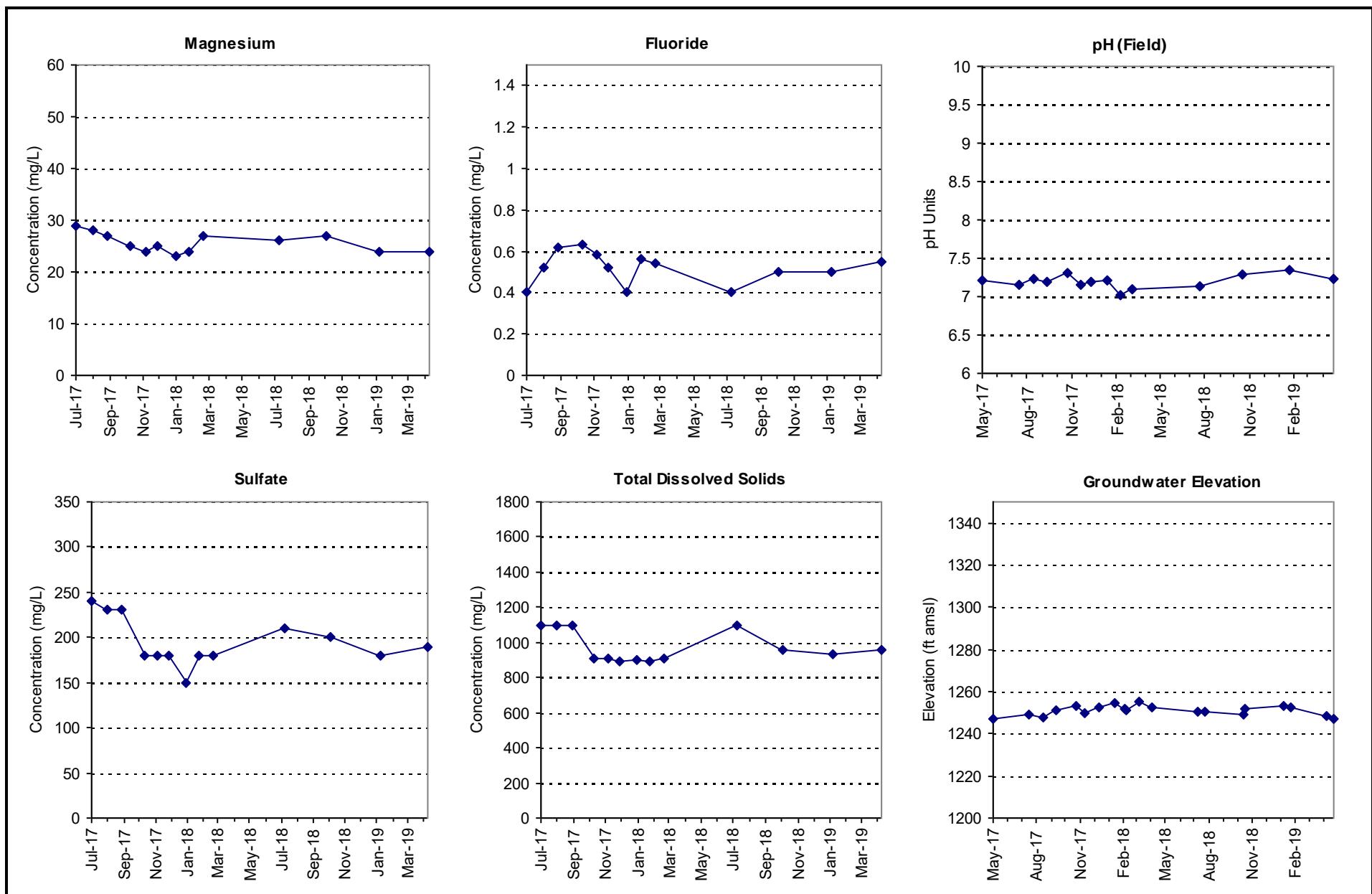
M54-LBF Quarterly Concentration Graphs



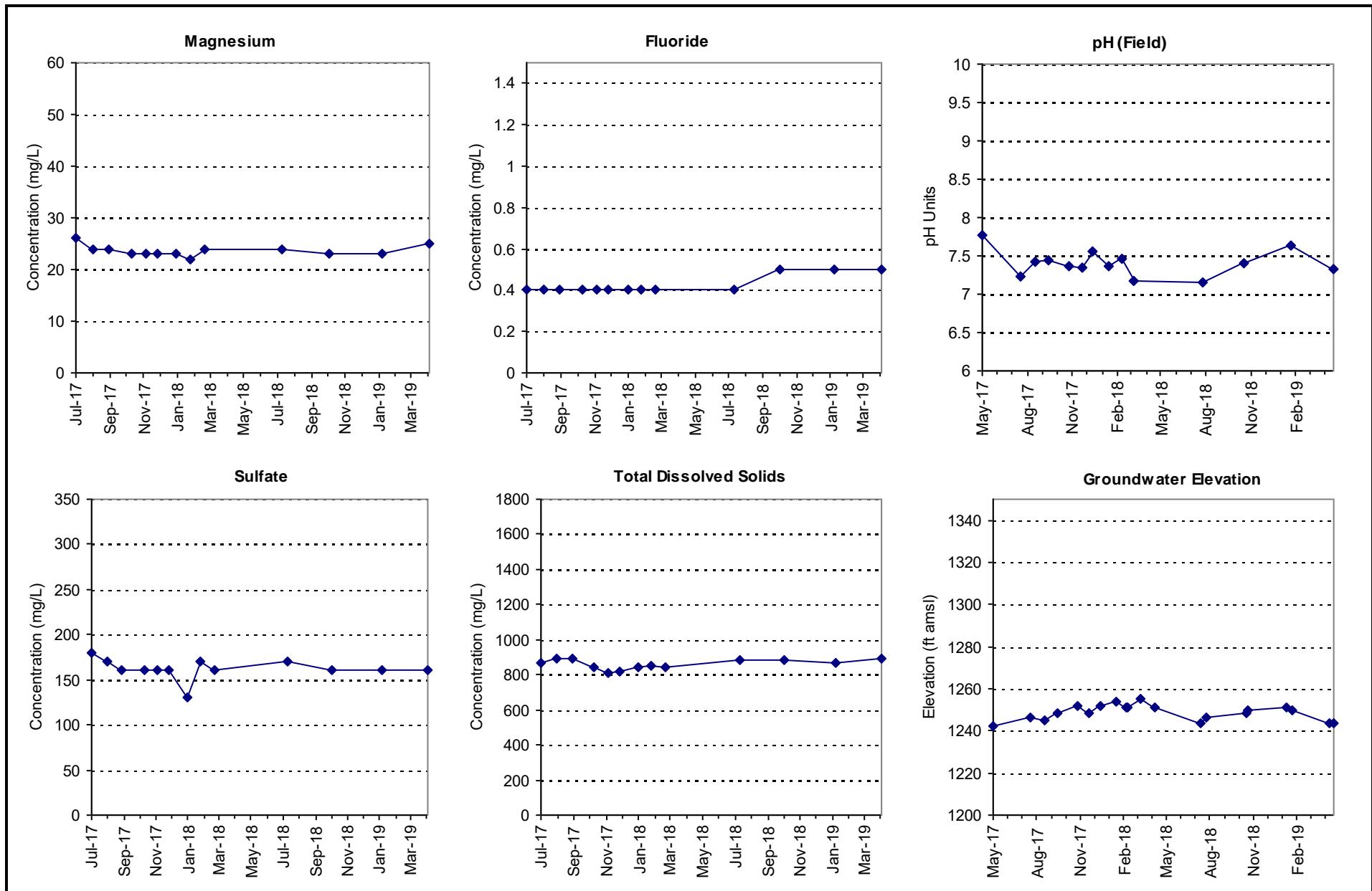
M54-O Quarterly Concentration Graphs



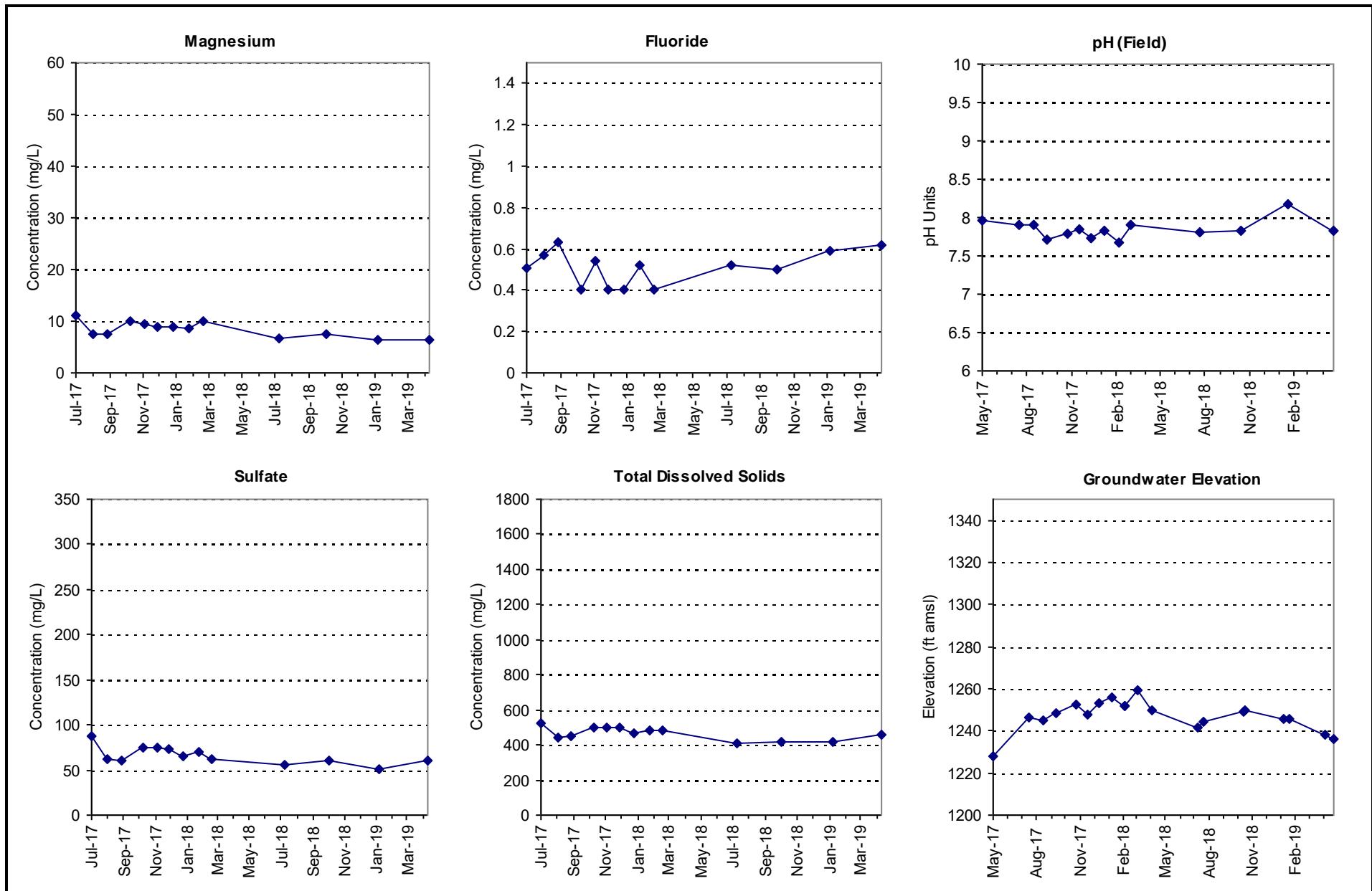
M55-UBF Quarterly Concentration Graphs



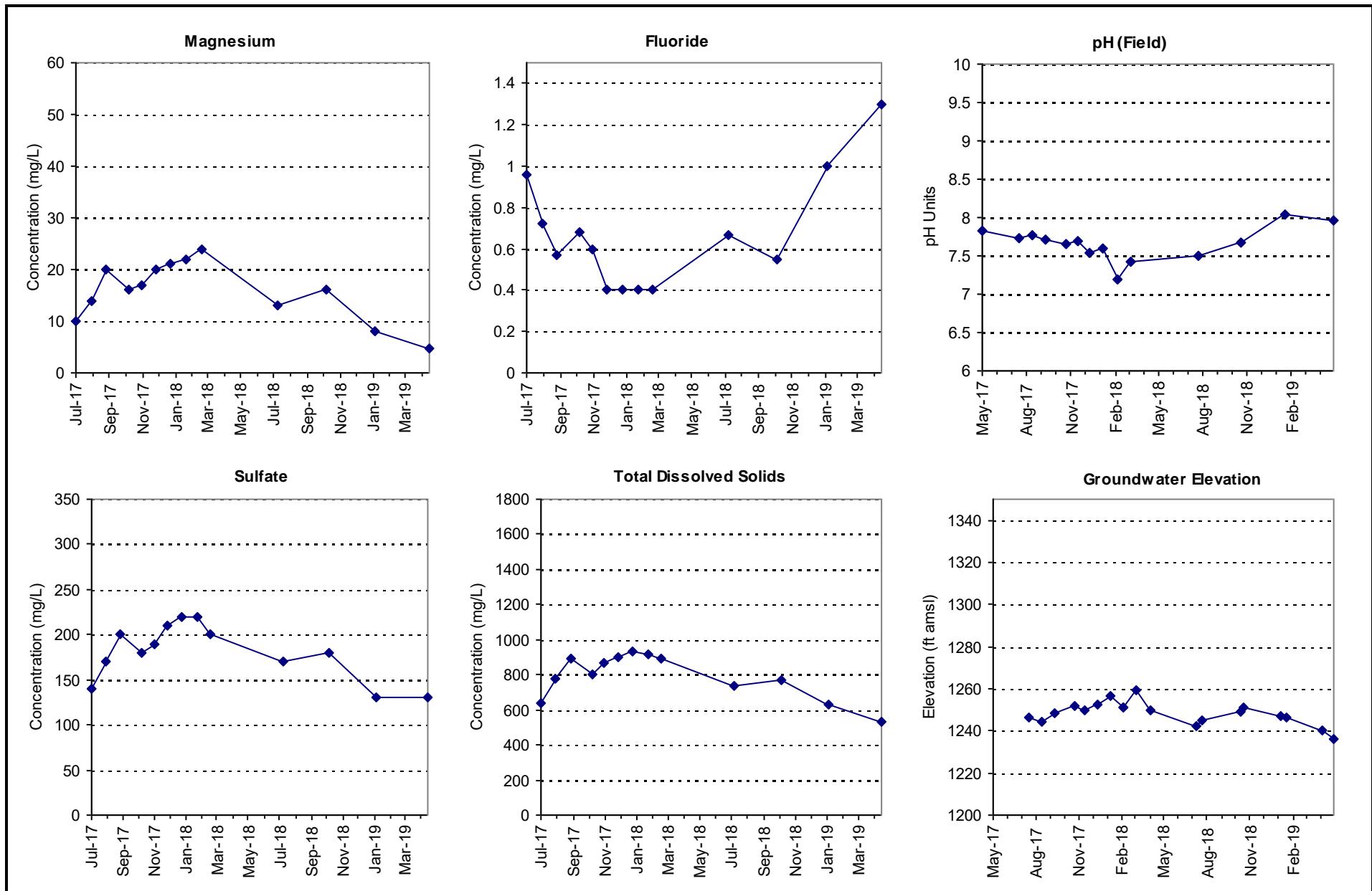
M56-LBF Quarterly Concentration Graphs



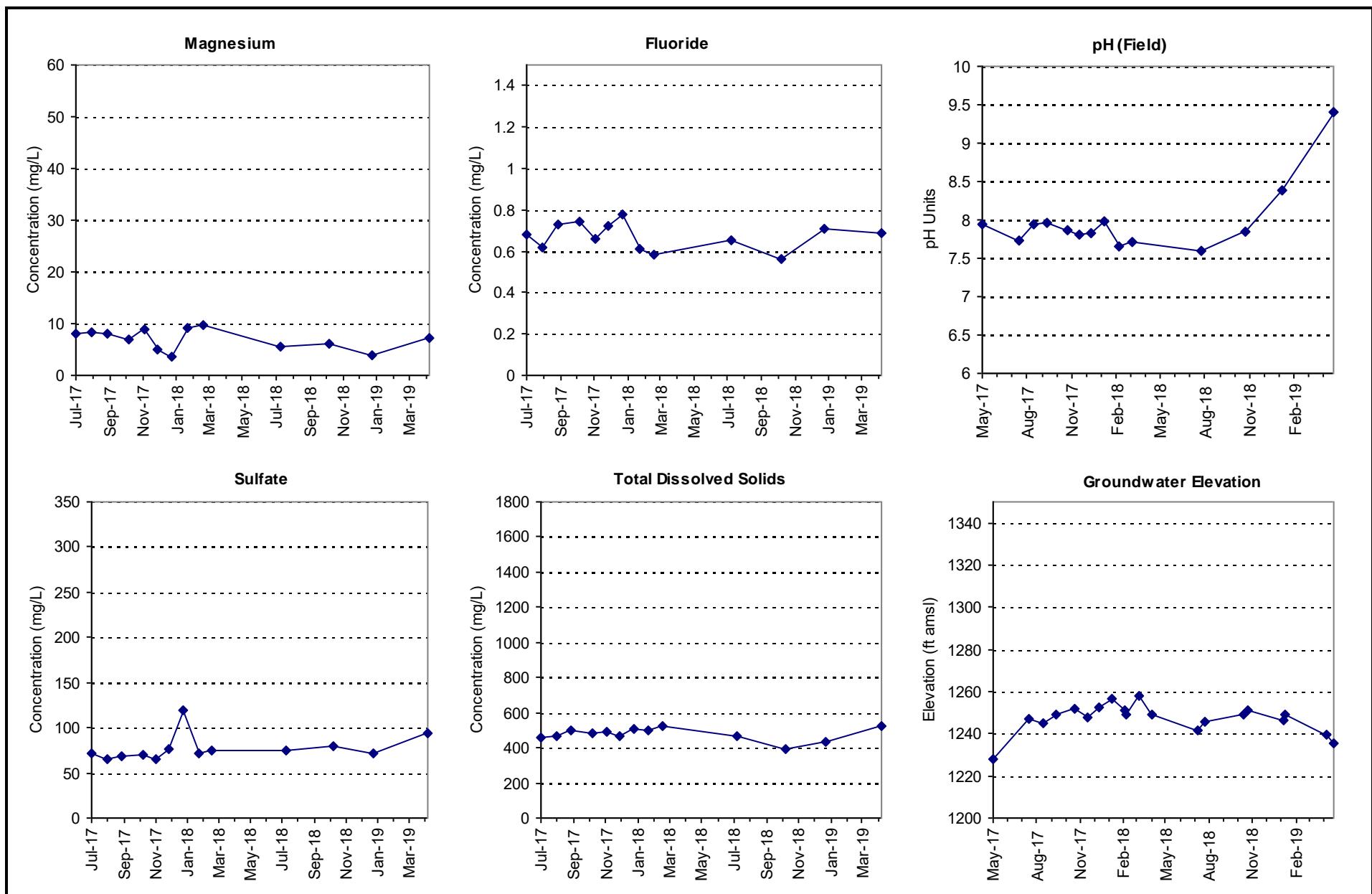
M57-O Quarterly Concentration Graphs



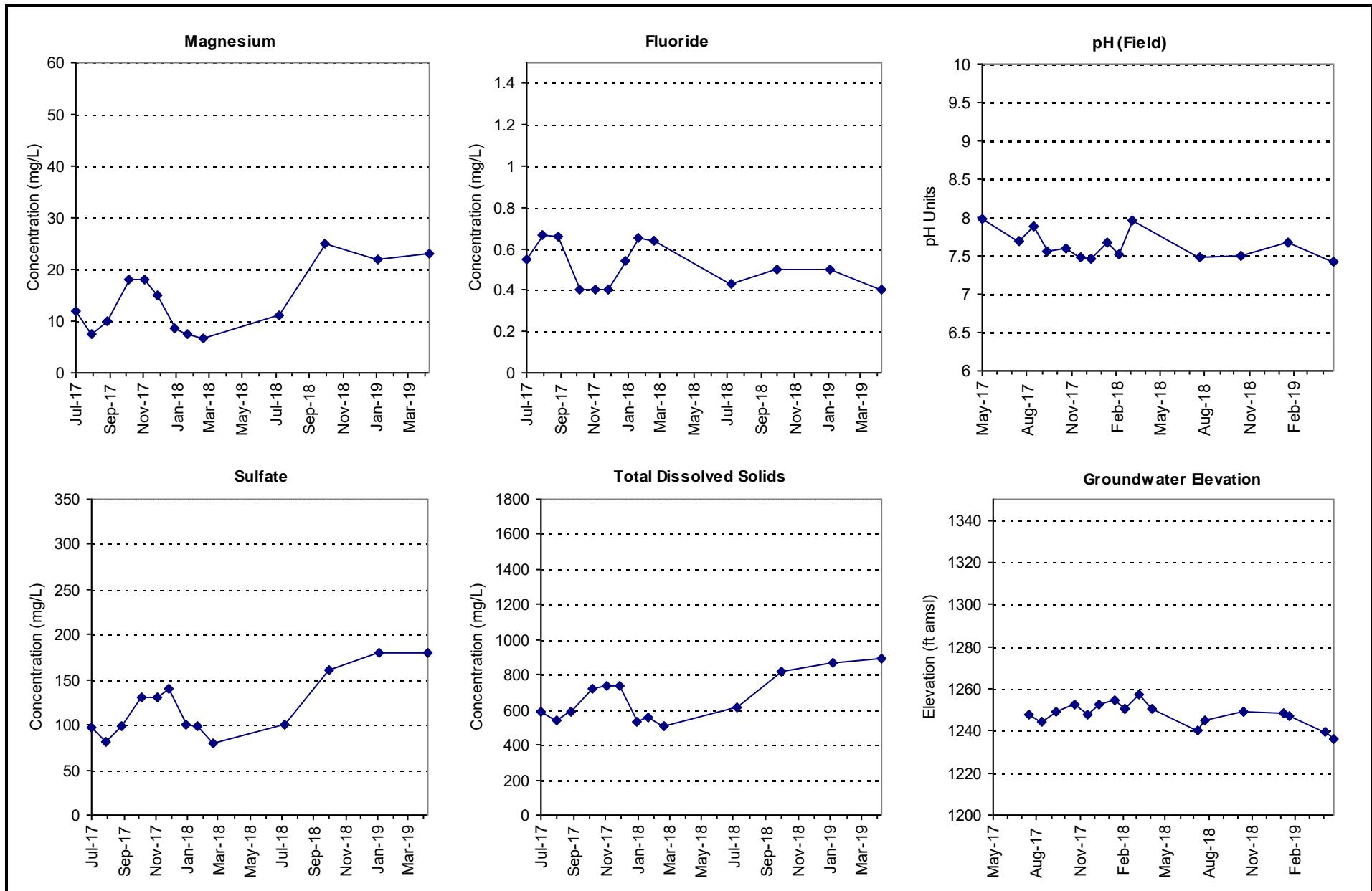
M58-O Quarterly Concentration Graphs



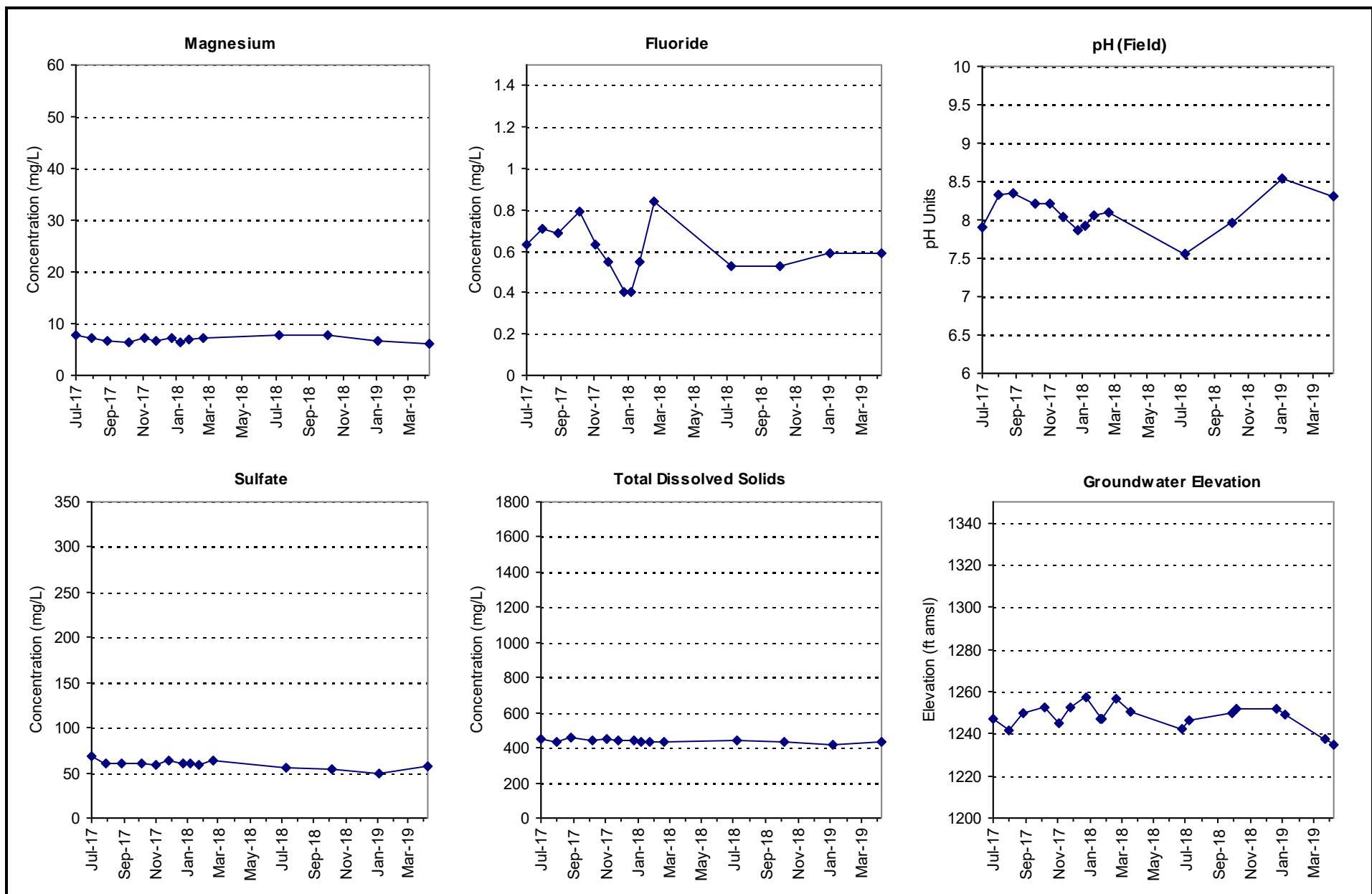
M59-O Quarterly Concentration Graphs



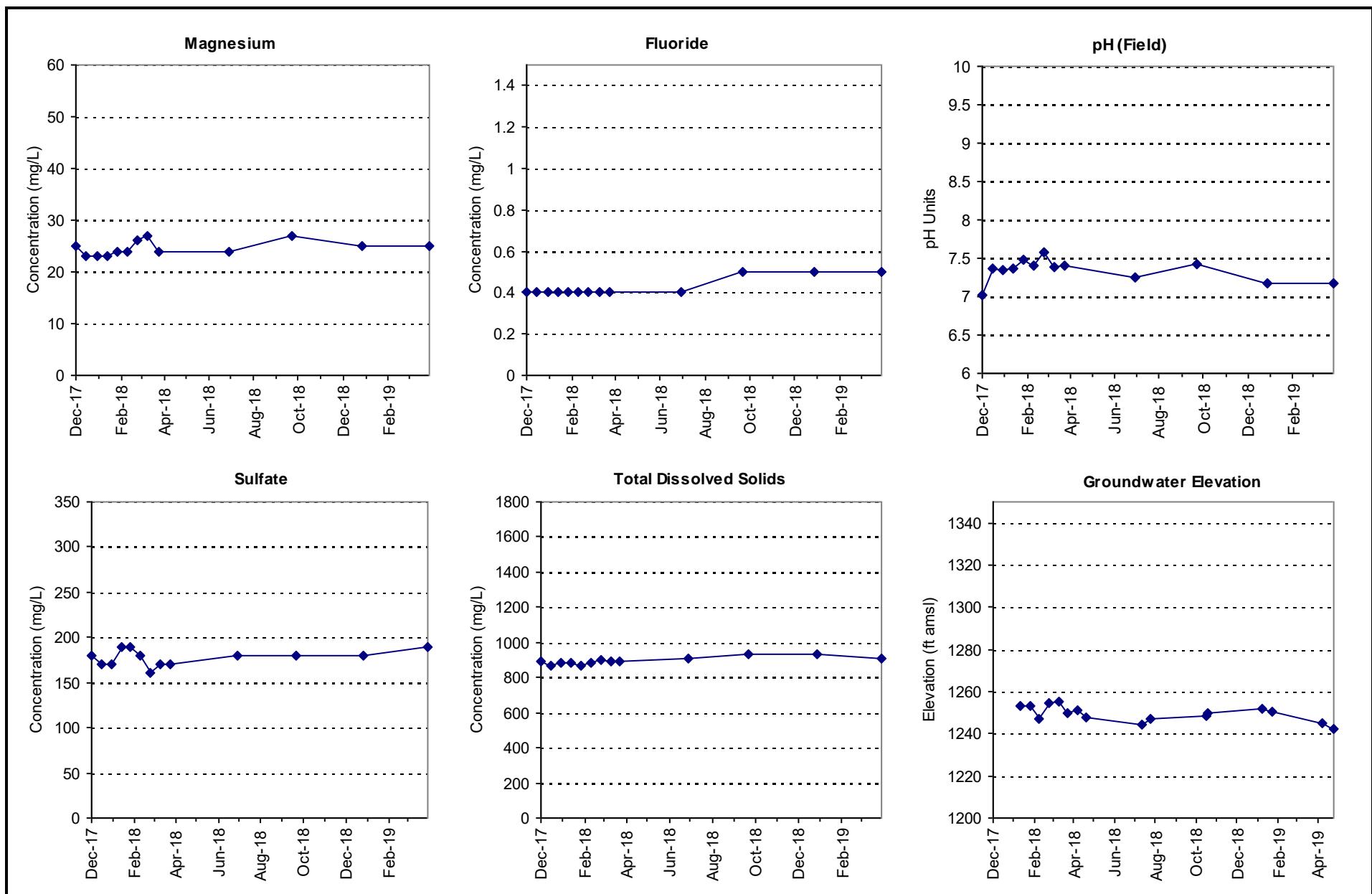
M60-O Quarterly Concentration Graphs



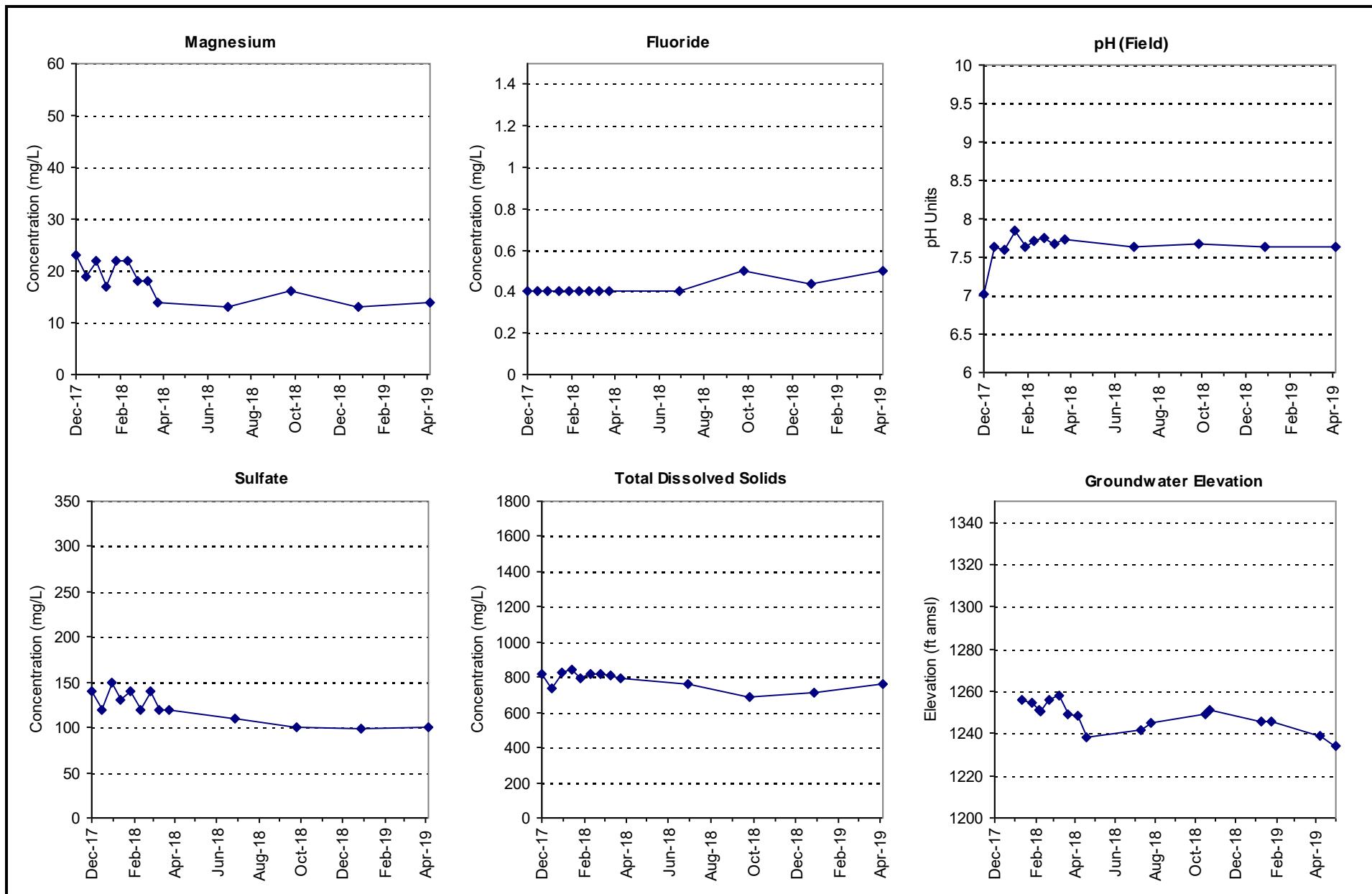
M61-LBF Quarterly Concentration Graphs



MW-01-LBF Quarterly Concentration Graphs

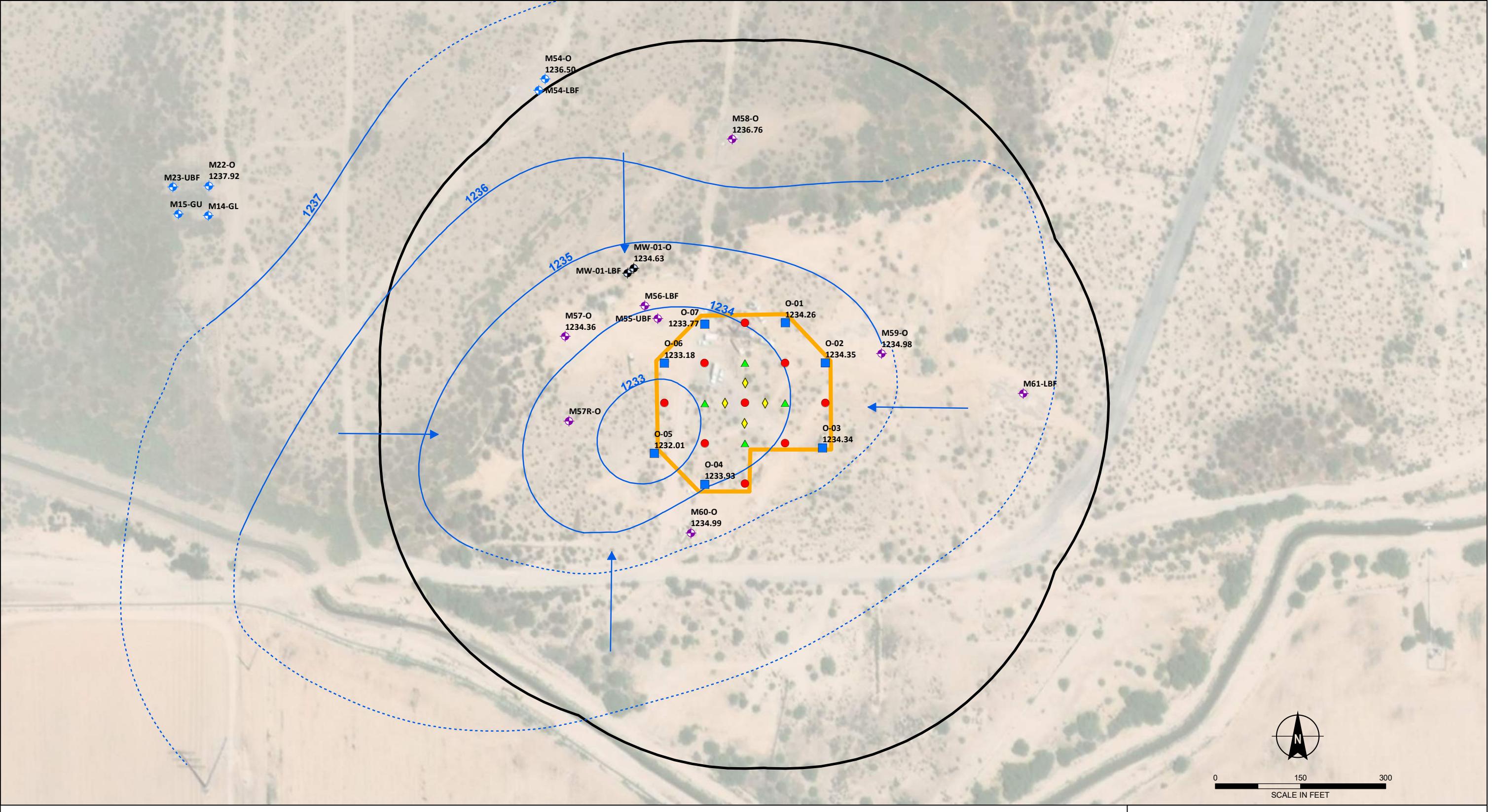


MW-01-O Quarterly Concentration Graphs



ATTACHMENT 8

Area Groundwater Elevation Contour Maps



█ OBSERVATION WELL
▲ INJECTION WELL
● RECOVERY WELL
◆ WESTBAY WELL
◆ POC WELL
● SUPPLEMENTAL MONITORING WELL
● OPERATIONAL MONITORING WELL

— APRIL 2019 GROUNDWATER ELEVATION CONTOURS
— INFERRED CONTOURS
— POLLUTANT MANAGEMENT
— PTF WELLFIELD

WELL ID: M59-O
 GROUNDWATER ELEVATION: 1244.91

NOTES

1. ALL LOCATIONS AND DIMENSIONS APPROXIMATE
2. GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL
3. CONTOUR INTERVAL = 1FT
4. WATER LEVEL DATA FROM WELLS COLLECTED 04/26/2019
5. ONLY WELLS COMPLETED IN THE BEDROCK OXIDE THAT HAVE CONTOUR ELEVATIONS LABELED WERE USED IN CONTOURING GROUNDWATER ELEVATIONS

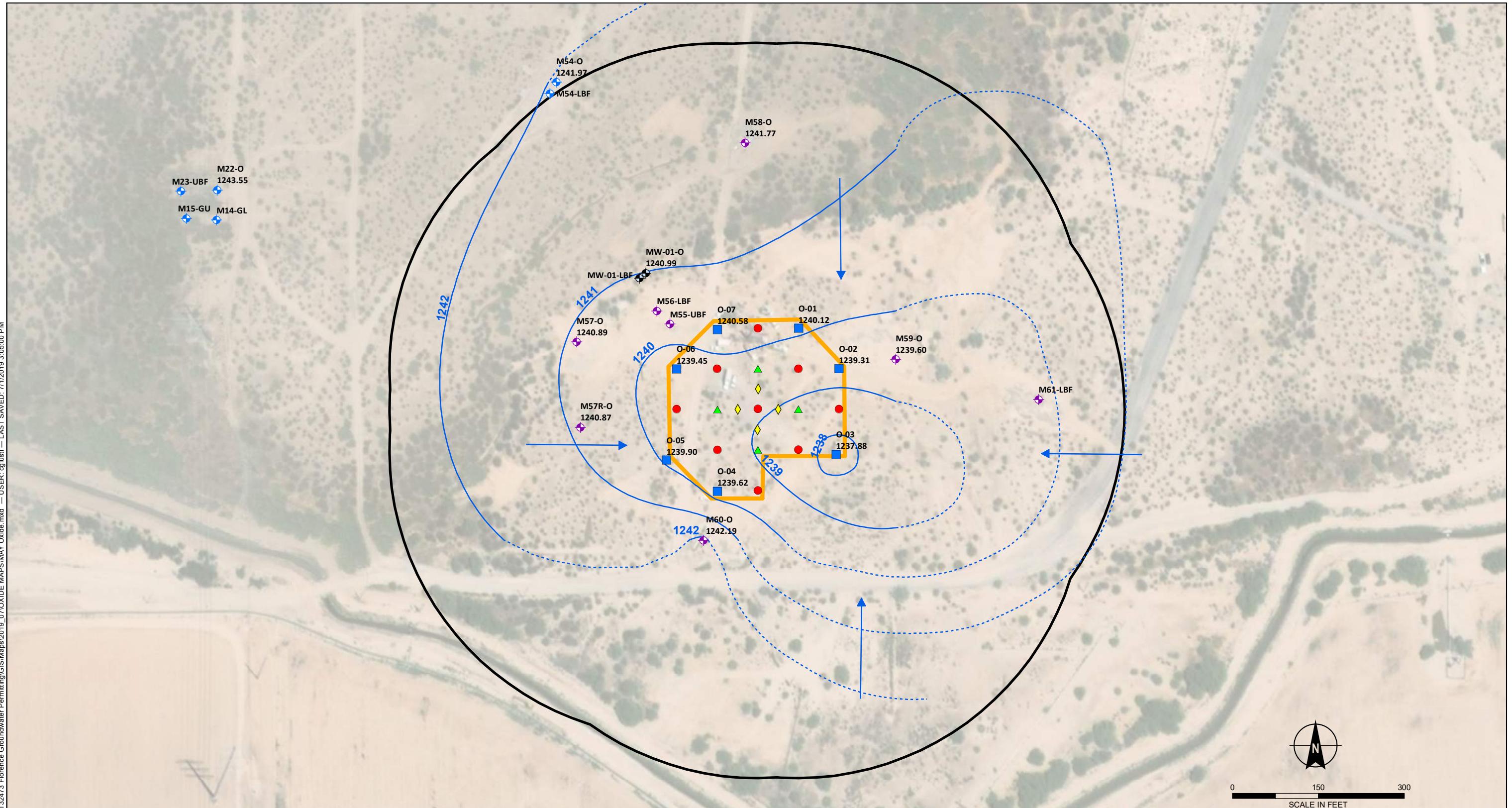
HALEY ALDRICH

PRODUCTION TEST FACILITY
FLORENCE COPPER, INC.
FLORENCE, ARIZONA

OXIDE GROUNDWATER
ELEVATION CONTOURS
APRIL 2019

FLORENCE COPPER

JULY 2019



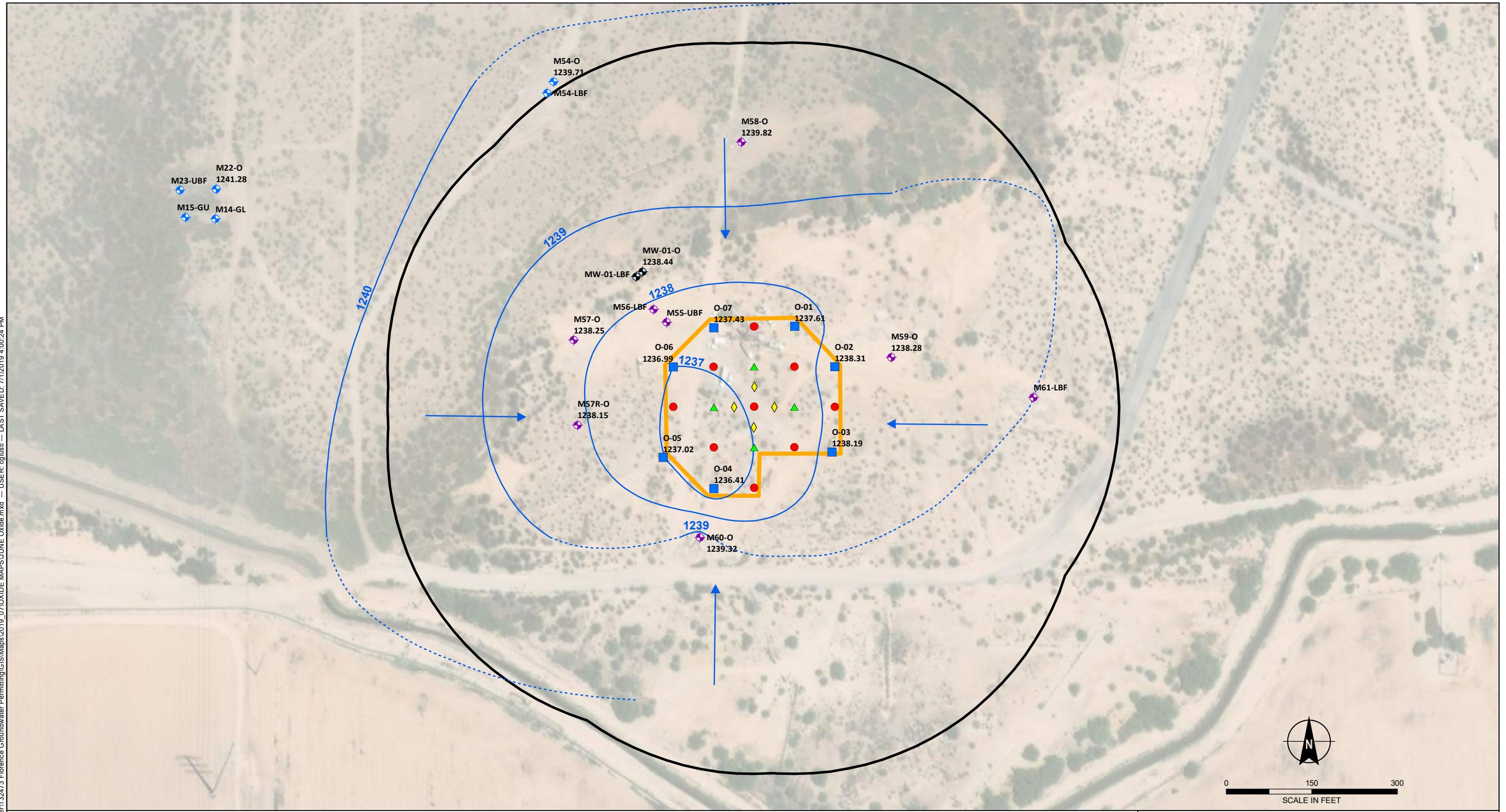
HALEY ALDRICH

PRODUCTION TEST FACILITY
FLORENCE COPPER, INC.
FLORENCE, ARIZONA

OXIDE GROUNDWATER
ELEVATION CONTOURS
MAY 2019

FLORENCE COPPER

JULY 2019



LEGEND

- OBSERVATION WELL
- ▲ INJECTION WELL
- RECOVERY WELL
- ◆ WESTBAY WELL
- ◆ POC WELL
- ◆ SUPPLEMENTAL MONITORING WELL
- ◆ OPERATIONAL MONITORING WELL

JUNE 2019 GROUNDWATER ELEVATION CONTOURS
INFERRED CONTOURS
POLLUTANT MANAGEMENT AREA
PTF WELLFIELD

WELL ID: M59-O
GROUNDWATER ELEVATION: 1244.91

NOTES

1. ALL LOCATIONS AND DIMENSIONS APPROXIMATE
2. GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL
3. CONTOUR INTERVAL = 1FT
4. WATER LEVEL DATA FROM WELLS COLLECTED 06/20/2019
5. ONLY WELLS COMPLETED IN THE BEDROCK OXIDE THAT HAVE CONTOUR ELEVATIONS LABELED WERE USED IN CONTOURING GROUNDWATER ELEVATIONS

HALEY ALDRICH

PRODUCTION TEST FACILITY
FLORENCE COPPER, INC.
FLORENCE, ARIZONA

OXIDE GROUNDWATER
ELEVATION CONTOURS
JUNE 2019

FLORENCE COPPER

JULY 2019

ATTACHMENT 9

Table of Monitor Well Details and Water Levels

Florence Copper Project
Quarterly Groundwater Monitoring

Temporary APP and UIC Monitoring Well Details							
Well ID	Well Type	ADWR #	Total Well Depth (ft bgs)	Latitude	Longitude	Screened Interval (ft bgs)	Aquifer Unit
M14-GL	POC	55-549172	838	33°03'4.00"N	111°26'15.77"W	778-838	LBFU
M15-GU	POC	55-547813	594	33°03'4.04"N	111°26'16.40"W	554-594	LBFU
M22-0	POC	55-555831	1,130	33°03'4.53"N	111°26'15.76"W	932-1,130	OXIDE
M23-UBF	POC	55-555824	250	33°03'4.51"N	111°26'16.50"W	210-250	UBFU
M54-LBF	POC	55-226792	629	33°03'7.07"N	111°26'9.29"W	310-629	LBFU
M54-0	POC	55-226798	1,199	33°03'6.91"N	111°26'9.22"W	668-1,199	OXIDE
M52-UBF	POC	55-226788	274	33°03'11.03"N	111°25'24.66"W	200-274	UBFU
M55-UBF	Monitor	55-226797	261	33°03'1.99"N	111°26'6.18"W	240-261	UBFU
M56-LBF	Monitor	55-226795	340	33°03'2.21"N	111°26'6.44"W	320-340	LBFU
M57-0	Monitor	55-226790	1,200	33°03'1.88"N	111°26'8.39"W	523-1,200	OXIDE
M57R-0	Monitor	55-22975	1,200	33°03'0.31"N	111°26'8.16"W	550-1,200	OXIDE
M58-0	Monitor	55-226794	1,200	33°03'5.20"N	111°26'4.94"W	594-1,200	OXIDE
M59-0	Monitor	55-226791	1,200	33°03'1.58"N	111°26'2.25"W	534-1,200	OXIDE
M60-0	Monitor	55-226796	1,201	33°02'58.70"N	111°26'5.78"W	444-1,201	OXIDE
M61-LBF	Monitor	55-226799	630	33°03'0.85"N	111°25'58.92"W	429-630	LBFU
MW-01-LBF	Operational	55-226789	440	33°03'02.9442"N	111°26'07.1046"W	330-440	LBFU
MW-01-0	Operational	55-226793	1,200	33°03'03.045"N	111°26'06.9786"W	500-1,200	OXIDE

New Wells Constructed or Replaced

None							
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ft bgs = Feet below Ground Surface

Florence Copper Project
Quarterly Groundwater Monitoring

Summary of Water Levels						
Sample Event:	Second Quarter 2019				Measured By:	M. Orcutt
Well ID	Sample Date	Depth to Water (feet bsl)	Description of Measuring Point	Elevation of Measuring Point (feet amsl)	Water Level Elevation (feet amsl)	Comments
M14-GL	4/8/2019	235.34	TOC	1477.12	1241.78	
M14-GL	4/17/2019	236.65	TOC	1477.12	1240.47	
M15-GU	4/8/2019	232.35	TOC	1476.53	1244.18	
M15-GU	4/17/2019	232.35	TOC	1476.53	1244.18	
M22-0	4/8/2019	238.01	TOM	1478.58	1240.57	
M22-0	4/17/2019	236.32	TOM	1478.58	1242.26	
M23-UBF	4/8/2019	220.74	TOM	1477.61	1256.87	
M23-UBF	4/17/2019	220.90	TOM	1477.61	1256.71	
M52-UBF	4/8/2019	231.78	TOC	1485.04	1253.26	
M52-UBF	4/16/2019	232.05	TOC	1485.04	1252.99	
M54-LBF	4/8/2019	236.22	TOC	1481.92	1245.70	
M54-LBF	4/18/2019	236.10	TOC	1481.92	1245.82	
M54-0	4/8/2019	242.26	TOC	1482.47	1240.21	
M54-0	4/18/2019	241.50	TOC	1482.47	1240.97	
M55-UBF	4/8/2019	230.57	TOC	1479.14	1248.57	
M55-UBF	4/24/2019	232.21	TOC	1479.14	1246.93	
M56-LBF	4/8/2019	234.90	TOC	1478.65	1243.75	
M56-LBF	4/18/2019	234.85	TOC	1478.65	1243.80	
M57-0	4/8/2019	240.20	TOC	1478.71	1238.51	
M57-0	4/25/2019	242.75	TOC	1478.71	1235.96	
M58-0	4/8/2019	240.88	TOC	1481.08	1240.20	
M58-0	5/1/2019	245.05	TOC	1481.08	1236.03	
M59-0	4/8/2019	240.35	TOC	1480.19	1239.84	
M59-0	4/24/2019	244.60	TOC	1480.19	1235.59	
M60-0	4/8/2019	238.05	TOC	1477.36	1239.31	
M60-0	4/25/2019	241.30	TOC	1477.36	1236.06	
M61-LBF	4/8/2019	243.08	TOC	1480.78	1237.70	
M61-LBF	4/25/2019	245.80	TOC	1480.78	1234.98	
MW-01-LBF	4/8/2019	234.02	TOC	1478.92	1244.90	
MW-01-LBF	4/24/2019	236.86	TOC	1478.92	1242.06	
MW-01-0	4/8/2019	240.32	TOC	1479.07	1238.75	
MW-01-0	5/1/2019	244.75	TOC	1479.07	1234.32	
Mine Shaft	4/8/2019	239.70	TOC	1480.40	1240.70	

Status of Local Production Wells

BIA-9R	4/8/2019	Not Pumping	
BIA-10	4/8/2019	Not Pumping	
PW2-1	4/8/2019	Not Pumping	
WW-4	4/8/2019	Not Pumping	

amsl = Above Mean Sea Level

TOC = Top of Casing

Wells are measured once as a field for static maps, then again at sampling for purge volumes.

TOM = Top of Monument

Pumping status of location production wells is determined by visual

NM = Not Measured

check once during the main measurement of the wellfield.

ATTACHMENT 10

Groundwater Sampling Results for POC and BADCT Wells

FLORENCE COPPER PROJECT
QUARTERLY COMPLIANCE MONITORING REPORT
TEMPORARY APP AND UIC PERMITS
SECOND QUARTER 2019



The Florence Copper Project is subject to three related permits issued by the Arizona Department of Environmental Quality (ADEQ) and the United States Environmental Protection Agency (USEPA).

[Signature]
Sitewide permits covering the 1997-98 Pilot Test Facility and future operations

- ADEQ Aquifer Protection Permit (APP) No. P-101704 dated October 13, 2017.

2018-19 Production Test Facility

- ADEQ Temporary APP No. P-106360 dated December 5, 2018.
- USEPA Underground Injection Control (UIC) No. R9UIC-AZ3FY11-1 dated December 20, 2016

This report documents sampling activities relating to the Temporary APP and UIC permits. The facility began active operations on December 15, 2018. The results were compared to the alert levels (ALs) and aquifer quality limits (AQLs) of the December 5, 2018 APP and the "Procedures for Determining Alert Levels and Aquifer Quality Limits for Groundwater Compliance Monitoring" dated December 12, 2018, submitted to the USEPA.

Sampling Activities

Sitewide water levels were collected on April 8 and 9, 2019 and groundwater sampling took place April 16 through May 1, 2019 (Second Quarter 2019). Groundwater sampling and analysis was conducted in accordance with the requirements of APP No. P-106360, Section 2.5.3 (Groundwater Monitoring and Sampling Protocols) and 2.5.8 (BADCT Monitoring Wells (Non-POC). and UIC Permit No. R9UIC-AZ3FY11-1 Part II.F (Monitoring Program)).

During the Second Quarter 2019 sampling event, 16 point-of-compliance (POC) and supplemental wells were sampled. = The majority of the monitoring well network is equipped with low-flow bladder pumps. Low-flow sampling was conducted in accordance with Section 2.5.3 (Groundwater Monitoring and Sampling Protocols). Well M22-O is equipped with a stainless steel electric pump and was sampled by purging a minimum of three borehole volumes. No reduced pumping volumes occurred, and there were no other modified sampling procedures noted.

Quarterly parameters, as listed in Section 4.0 Table 4.1-6 of the APP and Table 1 of the UIC, were analyzed from the designated POC and supplemental wells. The quarterly analytical parameters are magnesium, sulfate, fluoride, and total dissolved solids (TDS), in addition to field pH, temperature, and specific conductance. The field parameters of dissolved oxygen (DO) and turbidity are also monitored to determine stabilization of wells sampled using low-flow purging methods but are not reported.

During this quarter, semi-annual parameters were also analyzed which include trace metals, organics, inorganics and radionuclides. The semi-annual parameters, listed in Section 4.0 Table 4.1-7 of the APP and Table 1 of the UIC, are shown in Table 1 of this report. Total uranium activity is only analyzed if gross alpha exceeds 12.0 picocuries per liter (pCi/L).

Analyses of the samples were conducted by Turner Laboratories (Turner). Radiochemical analyses were provided by Radiation Safety Engineering, and total petroleum diesel hydrocarbons (TPH-D) analyses were performed by TestAmerica-Phoenix. Analytical results for the quarterly parameters are provided in the following tables:

- Table 2 – Quarterly Parameters
- Table 3 – Field Parameters
- Table 4 – Common Ions
- Table 5 – Formation related Radiochemicals
- Table 6 – Process related Organics
- Table 7 – Trace Metals.

For the purposes of the tables, where a difference exists between the APP and UIC, the lower ALs are shown.

The analytical reports include a discussion of all laboratory quality assurance/quality control samples. Result qualifiers were evaluated for impact to sample quality and all results are compared to the historical data set for consistency. Some parameters are reported as estimated values below the laboratory practical quantitation limits, noted as E4 or E8 qualified results. Results for laboratory pH and temperature are flagged for measurements outside of the 15-minute hold time. The laboratory results meet the data quality objectives.

On July 17, 2019, Florence Copper was notified of two potential AL or AQL exceedances for monitoring well M59-0. First, field pH was recorded at 9.41 (standard pH units), above the UIC upper pH AL of 8.7. Second, radiochemical gross beta was reported at 22.5 ± 1.7 picocuries per liter (pCi/L) above the UIC AL of 16 pCi/L. These parameters do not have APP established AL/AQLs. The other quarterly and semi-annual parameters were below the ALs.

Parameter	Date	Result	UIC AL/AQL	APP AL/AQL
pH	4/24/2019	9.41 pH units	8.7/NE – Upper	NE
Gross Beta	4/24/2019	22.5 ± 1.7 pCi/L	16/16	NE

Florence Copper expedited the collection of a verification pH measurement from M59-0 to determine whether the initial reading continued to be above the standard. To ensure a representative sample, the well was purged using the traditional three-well volume method. The pH was measured at 7.88 on July 19, 2019, indicating that the exceedance of the AL for pH has not been confirmed.

Florence Copper collected a verification sample from M59-0 for gross beta and for other constituents consistent with UIC Part II.H.2.c. That sample was collected on July 19, 2019. In accordance with UIC Part II.H.2.a.ii, Florence Copper will provide an update to USEPA

when the verification results for gross beta are available. The USEPA was notified of the preliminary results on July 19, 2019.

In the event of a discharge from the permitted process, pH would be expected to decrease, not increase. The gross beta result is below the AL/AQLs set for other wells in the monitoring network. Therefore, these changes are not likely a result of operations. It is possible that the localized drawdown of water due to operations has pulled water towards M59-O that is of a different composition than collected during the ambient monitoring period, affecting pH and gross beta. A similar increase was observed for potassium. Carbonate alkalinity increased, while bicarbonate alkalinity decreased.

There are possible upward trends in M60-O for several parameters which will be monitored. The trends are not yet significant. Fluoride has increased in M58-O; however, it is well below the AL. No other significant trends are observable. Sitewide trends are discussed in the monitoring report for the Sitewide wells which have a greater historical dataset.

Contingency Sampling Plans

No contingency sampling plan was required during the Second Quarter 2019. M59-O was sampled for verification in the Third Quarter 2019 as discussed above.

Table 1. Summary of Sampling Analyses

Analysis	Method	Preservative
Quarterly Monitoring Parameters		
Fluoride	EPA 300.0	None
Magnesium	EPA 200.7	HNO ₃
Sulfate	EPA 300.0	None
Total Dissolved Solids	SM 2540C	None
Semi-Annual Monitoring Parameters		
Inorganic Common Ions		
pH (lab)	SM 4500H+	None
Electroconductivity (EC) (lab)	SM 2510B	None
Bicarbonate Alkalinity	SM 2320B	None
Carbonate Alkalinity	SM 2320B	None
Hydroxide Alkalinity	SM 2320B	None
Total Alkalinity	SM 2320B	None
Chloride	EPA 300.0	None
Fluoride (Quarterly)	EPA 300.0	None
Nitrate as N	EPA 300.0	None
Nitrite as N	EPA 300.0	None
Sulfate (Quarterly)	EPA 300.0	None
Total Dissolved Solids (Quarterly)	SM 2540C	None
Cation/Anion Balance	Calculation	-
Formation-Related Radiochemicals		
Gross Alpha	600/00-02	None
Gross Beta	900.0	None
Radium 226	903/GammaRay HPGE	None
Radium 228	904/GammaRay HPGE	None
Total Uranium Isotopes (if G. Alpha >12.0)	ASTM 6239	None
Radon 222	7500-Rn	None (Voa)
Total Uranium (unfiltered total as mg/L)	EPA 200.8	HNO ₃
Process-Related Organics		
Extractable Fuel Hydrocarbons (Diesel-Range Organics)	EPA 8015D	None
Benzene	EPA 8260B	HCl Voa
Ethylbenzene	EPA 8260B	HCl Voa
Toluene	EPA 8260B	HCl Voa
Total Xylene	EPA 8260B	HCl Voa
Naphthalene	EPA 8260B	HCl Voa
Octane	EPA 8260B	HCl Voa
Trace Metals (Dissolved)		
Aluminum	EPA 200.8	HNO ₃
Antimony	EPA 200.8	HNO ₃
Arsenic	EPA 200.8	HNO ₃
Barium	EPA 200.8	HNO ₃
Beryllium	EPA 200.8	HNO ₃

Table 1. Summary of Sampling Analyses

Analysis	Method	Preservative
Calcium	EPA 200.7	HN03
Cadmium	EPA 200.8	HN03
Chromium	EPA 200.8	HN03
Cobalt	EPA 200.8	HN03
Copper	EPA 200.8	HN03
Iron	EPA 200.7	HN03
Lead	EPA 200.8	HN03
Magnesium (Level I)	EPA 200.7	HN03
Manganese	EPA 200.8	HN03
Mercury	EPA 245.1	HN03
Nickel	EPA 200.8	HN03
Potassium	EPA 200.7	HN03
Selenium	EPA 200.8	HN03
Sodium	EPA 200.7	HN03
Thallium	EPA 200.8	HN03
Zinc	EPA 200.8	HN03

Table 2. Summary of Analytical Results, Quarterly Parameters

Well ID	Sample Date	Magnesium		Sulfate		Fluoride		Total Dissolved Solids	
		Concentration	Alert Level	Concentration	Alert Level	Concentration	Alert Level	Concentration	Alert Level
M14-GL	Apr 17 2019	1.7	23	54	144	0.52	3.2	410	874
M15-GU	Apr 17 2019	21	44	72	126	<0.5	3.2	690	1359
M22-0	Apr 17 2019	6.1	8.6	36	86	<0.5	3.2	440	1094
M23-UBF	Apr 17 2019	29	69	240	411	0.51	3.2	1100	2392
M52-UBF	Apr 16 2019	22	41	170	316	0.6	3.2	840	1502
M54-LBF	Apr 18 2019	22	42	170	297	0.69	3.2	870	1561
M54-0	Apr 18 2019	5.7	10	48	200	0.78	3.2	430	771
M55-UBF	Apr 24 2019	24	45	190	425	0.55	3.2	960	1711
M56-LBF	Apr 18 2019	25	41	160	281	<0.5	3.2	890	1485
M57-0	Apr 25 2019	6.5	18	60	200	0.62	3.2	460	842
M58-0	May 01 2019	4.7	51	130	385	1.3	3.2	530	1539
M59-0	Apr 24 2019	7.2	23	94	202	0.69	3.2	520	854
M60-0	Apr 25 2019	23	45	180	271	<0.4	3.2	890	1314
M60-0 (Dup)	Apr 25 2019	24	45	170	271	<0.4	3.2	890	1314
M61-LBF	Apr 25 2019	6.2	12	58	200	0.59	3.2	430	769
MW-01-LBF	Apr 24 2019	25	43	190	307	<0.5	3.2	910	1543
MW-01-0	May 01 2019	14	42	100	229	<0.5	3.2	760	1409
MW-01-0 (Dup)	May 01 2019	14	42	100	229	<0.5	3.2	760	1409
Arizona Aquifer Water Quality Standard		NE		NE		4		NE	

All Results in Milligrams per Liter (mg/l)

< = Less than the Laboratory Practical Quantitation Limit

NE = Not established

Where APP and UIC Alert Levels differ, the lower UIC levels are shown

Table 3. Summary of Quarterly Field Parameters

Well ID	Sample Date	Temperature (°C)	Temperature (°F)	pH	pH Low Alert Level	pH High Alert Level	Conductivity (µmhos/cm)
M14-GL	Apr 17 2019	19.9	67.8	8.65	NE	NE	760
M15-GU	Apr 17 2019	19.5	67.1	7.6	NE	NE	1255
M22-0	Apr 17 2019	25.6	78.1	8.23	NE	NE	752
M23-UBF	Apr 17 2019	19.8	67.6	7.23	NE	NE	1839
M52-UBF	Apr 16 2019	20.6	69.1	7.35	6.9	7.9	1391
M54-LBF	Apr 18 2019	21	69.8	7.35	6.5	8.2	1482
M54-0	Apr 18 2019	20.1	68.2	7.88	6.8	9.4	721
M55-UBF	Apr 24 2019	20.8	69.4	7.23	6.6	7.8	1574
M56-LBF	Apr 18 2019	21.6	70.9	7.32	6.5	8.3	1492
M57-0	Apr 25 2019	20.9	69.6	7.83	7.2	8.5	746
M58-0	May 01 2019	20.9	69.6	7.97	6.2	9.0	816
M59-0	Apr 24 2019	20.4	68.7	9.41	7.0	8.7	883
M60-0	Apr 25 2019	20	68.0	7.42	6.3	9.0	1430
M61-LBF	Apr 25 2019	23.2	73.8	8.31	6.8	9.4	747
MW-01-LBF	Apr 24 2019	21.1	70.0	7.17	6.2	8.5	1457
MW-01-0	May 01 2019	20.8	69.4	7.64	5.8	9.4	1221
Alert Levels		NE	NE	By Well*	By Well*	By Well*	NE
Arizona Aquifer Water Quality Standard		NE	NE	NE	NE	NE	NE

NE = Not established

*UIC = Underground Injection Control Permit

Where APP and UIC Alert Levels differ, the lower UIC levels are shown

M59-0 pH exceedance verified in July 2019

Table 4. Summary of Common Inorganic Analytical Results, Semi-Annual Parameters

Well ID	Sample Date	Bicarbonate Alkalinity	Carbonate Alkalinity	Calcium	Chloride	Nitrate as N	Nitrate Alert Level	Nitrite as N	Potassium	Sodium	pH (Lab)	EC (Lab)	Ion Balance
M14-GL	Apr 17 2019	60	<2.	15	150	0.85	NE	<0.1	<5.	130	8.5	750	3.27
M15-GU	Apr 17 2019	130	<2.	81	250	4.7	NE	<0.1	<5.	110	7.5	1200	7.32
M22-0	Apr 17 2019	90	<2.	33	130	0.6	NE	<0.1	<5.	100	8.	740	3.47
M23-UBF	Apr 17 2019	180	<2.	150	320	9.3	NE	<0.1	5.4	190	7.4	1900	2.56
M52-UBF	Apr 16 2019	190	<2.	98	210	9.3	18.3	<0.1	<5.	140	7.2	1400	7.46
M54-LBF	Apr 18 2019	190	<2.	110	230	10.	18.4	<0.1	<5.	150	7.2	1500	5.71
M54-0	Apr 18 2019	110	<2.	28	120	<0.5	8.0	0.19	<5.	100	7.7	710	9.58
M55-UBF	Apr 24 2019	200	<2.	120	230	8.4	17.0	<0.1	5.1	150	7.	1600	4.65
M56-LBF	Apr 18 2019	180	<2.	110	230	9.5	15.5	0.28	5.9	160	7.3	1500	0.78
M57-0	Apr 25 2019	110	<2.	34	130	<0.5	8.0	<0.1	<5.	88	7.6	720	14.1
M58-0	May 01 2019	150	<2.	28	84	1.1	17.4	<0.1	<5.	130	7.7	810	9.71
M59-0	Apr 24 2019	62	40.	40	150	1.2	8.0	<0.1	19.	100	8.8	850	10.2
M60-0	Apr 25 2019	210	<2.	110	210	8.7	16.3	<0.1	5.3	130	7.3	1300	7.5
M60-0 (Dup)	Apr 25 2019	200	<2.	110	210	8.5	16.3	<0.1	5.5	130	7.3	1500	6.13
M61-LBF	Apr 25 2019	96	<2.	30	130	<0.5	8.0	<0.1	5.3	86	8.	720	12
MW-01-LBF	Apr 24 2019	220	<2.	110	200	9.	16.1	<0.1	5.8	140	7.1	1600	5.97
MW-01-0	May 01 2019	130	<2.	72	240	4.7	13.5	<0.1	5.3	150	7.4	1200	5.51
MW-01-0 (Dup)	May 01 2019	130	<2.	72	240	4.7	13.5	<0.1	5.3	150	7.5	1200	5.51
Alert Levels		NE	NE	NE	NE	By well*	By well*	0.8 *	NE	NE	NE	NE	NE
AWQS		NE	NE	NE	NE	10	10	1	NE	NE	NE	NE	NE

All results in milligrams per liter (mg/L), except

-pH in pH units

-Ion Balance, a calculation

-EC, µmhos/cm

< = less than detection limit

AWQS = Arizona Aquifer Water Quality Standard

NE = Not established

*Underground Injection Control (UIC) Permit

Where APP and UIC Alert Levels differ, the lower UIC levels are shown

Brown AND Caldwell :

Table 5. Summary of Radiochemical Analytical Results, Semi-Annual Parameters

Well ID	Sample Date	Gross Alpha	Gross Alpha Alert Level	Uranium Isotopes	Adjusted Gross Alpha	Gross Beta	Gross Beta Alert Level*	Radium 226+228	Radium Alert Level	Radon	Radon Alert Level*	Total Uranium (mg/L)	Uranium Alert Level*
M14-GL	Apr 17 2019	0.5 ± 0.2	12	-	-	<2.1	NE	<0.6	4	1020.6 ± 102.9	NE	<0.0005	NE
M15-GU	Apr 17 2019	2.9 ± 0.4	12	-	-	7.6 ± 1.4	NE	<0.6	4	679.2 ± 68.9	NE	0.0032	NE
M22-0	Apr 17 2019	2.3 ± 0.3	12	-	-	6.1 ± 1.3	NE	<0.6	4	1727.4 ± 173.6	NE	0.0031	NE
M23-UBF	Apr 17 2019	5 ± 0.8	12	-	-	6.6 ± 1.6	NE	<0.6	4	230.5 ± 24.3	NE	0.0056	NE
M52-UBF	Apr 16 2019	5 ± 0.5	12	-	-	5.1 ± 1.4	18.0	<0.6	4	121.4 ± 13.7	265	0.0049	0.0081
M54-LBF	Apr 18 2019	4.7 ± 0.4	12.9	-	-	6.4 ± 1.4	26.0	<0.7	4	485.3 ± 49.3	1,242	0.0045	0.0118
M54-0	Apr 18 2019	2.6 ± 0.3	12.6	-	-	5.4 ± 1.3	28.0	<0.7	4	1739 ± 174.7	8,453	0.0042	0.0193
M55-UBF	Apr 24 2019	5 ± 0.5	12	-	-	6.5 ± 1.4	17.0	<0.7	4	170.4 ± 18.4	394	0.0045	0.0098
M56-LBF	Apr 18 2019	6.2 ± 0.5	13.6	-	-	9.1 ± 1.5	22.0	<0.7	4	552.8 ± 56.2	1,152	0.0065	0.0148
M57-0	Apr 25 2019	2 ± 0.3	12	-	-	4.2 ± 1.1	16.0	<0.7	4	3003.2 ± 301	11,180	0.002	0.0135
M58-0	May 01 2019	4.9 ± 0.5	15	-	-	6.3 ± 1.3	47.0	<0.7	13.1	2061.9 ± 207	13,070	0.0058	0.1341
M59-0	Apr 24 2019	6.9 ± 0.6	15.8	-	-	22.5 ± 1.7	16.0	2.8 ± 0.5	6.9	6921.3 ± 692.9	20,462	0.0015	0.0052
M60-0	Apr 25 2019	34.9 ± 1.3	17.4	34.1 ± 2	0.8 ± 2.4	23.3 ± 1.8	33.0	6.4 ± 0.5	13.9	837.1 ± 84.6	2,480	0.047	0.0612
M60-0 (Dup)	Apr 25 2019	39.3 ± 1.4	17.4	38.3 ± 2.2	1 ± 2.6	14.6 ± 1.4	33.0	4.7 ± 0.4	13.9	919.8 ± 92.9	2,480	0.047	0.0612
M61-LBF	Apr 25 2019	2.3 ± 0.3	12	-	-	7.2 ± 1.3	16.0	<0.7	4	89.8 ± 10.4	5,869	0.0016	0.0041
MW-01-LBF	Apr 24 2019	10.4 ± 0.7	21.1	-	-	6.5 ± 1.4	21.0	<0.7	4	412.9 ± 42.1	2,094	0.012	0.0154
MW-01-0	May 01 2019	9 ± 0.6	21.9	-	-	9.5 ± 1.4	34.0	2.4 ± 0.4	14.4	3503.8 ± 351.1	15,707	0.0084	0.0330
MW-01-0 (Dup)	May 01 2019	7.9 ± 0.6	21.9	-	-	8.9 ± 1.4	34.0	1.1 ± 0.4	14.4	3705.1 ± 371.3	15,707	0.0084	0.0330
Arizona Aquifer Water Quality Standard		NE ¹	NE ¹	15 ¹	15 ¹	4 mrem/yr ²	4 mrem/yr ²	5	5	NE	NE	NE	NE

All results in pico-curies per liter (unless noted) ± a standard deviation of two (pCi/L ± 2σ)

< = less than detection limit

NE = Not established

¹The AWQS applies to Adjusted Alpha which equals Gross Alpha minus Uranium Isotopes. Uranium activity is measured and adjusted gross alpha is calculated when Gross Alpha exceeds 12 pCi/L

²Beta speciations are performed above 50 pCi/L. All ambient results were below the speciation level

*Underground Injection Control Permit

Where APP and UIC Alert Levels differ, the lower UIC levels are shown

Gross Beta exceedance to be verified in Third Quarter 2019

Table 6. Summary of Organic Analytical Results, Semi-Annual Parameters

Well ID	Sample Date	Benzene	Ethylbenzene	Toluene	Total Xylene	Naphthalene	Octane	Extractable Fuel Hydrocarbons
M14-GL	Apr 17 2019	<0.0005	<0.0005	<0.0005	<0.0015	<0.002	<0.0005	<0.1
M15-GU	Apr 17 2019	<0.0005	<0.0005	<0.0005	<0.0015	<0.002	<0.0005	<0.1
M22-0	Apr 17 2019	<0.0005	<0.0005	<0.0005	<0.0015	<0.002	<0.0005	<0.1
M23-UBF	Apr 17 2019	<0.0005	<0.0005	<0.0005	<0.0015	<0.002	<0.0005	<0.1
Alert Levels		0.004	0.56	0.08	8	NE	NE	NE
M52-UBF	Apr 16 2019	<0.0005	<0.0005	<0.0005	<0.0015	<0.002	<0.0005	<0.1
M54-LBF	Apr 18 2019	<0.0005	<0.0005	<0.0005	<0.0015	<0.002	<0.0005	<0.1
M54-0	Apr 18 2019	<0.0005	<0.0005	<0.0005	<0.0015	<0.002	<0.0005	<0.1
M55-UBF	Apr 24 2019	<0.0005	<0.0005	<0.0005	<0.0015	<0.002	<0.0005	<0.1
M56-LBF	Apr 18 2019	<0.0005	<0.0005	<0.0005	<0.0015	<0.002	<0.0005	<0.1
M57-0	Apr 25 2019	<0.0005	<0.0005	<0.0005	<0.0015	<0.002	<0.0005	<0.1
M58-0	May 01 2019	<0.0005	<0.0005	<0.0005	<0.0015	<0.002	<0.0005	<0.1
M59-0	Apr 24 2019	<0.0005	<0.0005	0.0029	<0.0015	<0.002	<0.0005	<0.1
M60-0	Apr 25 2019	<0.0005	<0.0005	<0.0005	<0.0015	<0.002	<0.0005	<0.1
M60-0 (Dup)	Apr 25 2019	<0.0005	<0.0005	<0.0005	<0.0015	<0.002	<0.0005	<0.1
M61-LBF	Apr 25 2019	<0.0005	<0.0005	<0.0005	<0.0015	<0.002	<0.0005	<0.1
MW-01-LBF	Apr 24 2019	<0.0005	<0.0005	<0.0005	<0.0015	<0.002	<0.0005	<0.1
MW-01-0	May 01 2019	<0.0005	<0.0005	<0.0005	<0.0015	<0.002	<0.0005	<0.1
MW-01-0 (Dup)	May 01 2019	<0.0005	<0.0005	<0.0005	<0.0015	<0.002	<0.0005	<0.1
Alert Levels		0.004	0.56	0.8	8.	0.0035*	0.0009*	0.28 *
AWQS		0.005	0.7	1	10	NE	NE	NE

All results are in milligrams per liter (mg/L)

< = less than detection limit

AWQS = Arizona Aquifer Water Quality Standard

NE = Not established

*Underground Injection Control (UIC) Permit

Where APP and UIC Alert Levels differ, the lower UIC levels are shown

Brown AND Caldwell :

Table 7. Summary of Trace Metal Analytical Results, Semi-Annual Parameters

Well ID	Sample Date	Aluminium	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Nickel	Selenium	Thallium	Zinc
M14-GL	Apr 17 2019	<0.04	<0.0005	0.001	0.016	<0.0003	<0.0003	0.0036	<0.0003	0.0009	0.0044	<0.0005	0.0011	<0.0001	0.0062	<0.0025	<0.0005	<0.04
M15-GU	Apr 17 2019	<0.04	<0.0005	0.0021	0.0042	<0.0003	<0.0003	0.0027	<0.0003	0.0012	<0.0031	<0.0005	0.0004	<0.0001	0.012	<0.0025	<0.0005	<0.04
M22-0	Apr 17 2019	<0.04	<0.0005	<0.0005	0.0032	<0.0003	<0.0003	0.0016	<0.0003	0.001	0.071	<0.0005	0.015	<0.0001	0.0019	<0.0025	<0.0005	<0.04
M23-UBF	Apr 17 2019	<0.04	<0.0005	0.0024	0.07	<0.0003	<0.0003	0.0009	<0.0003	0.0013	0.0094	<0.0005	0.0028	<0.0001	0.0047	<0.0025	<0.0005	<0.04
Alert Levels		0.71	0.0048	0.026	1.6	0.0032	0.004 ³	0.08	0.005	0.51	2.2	0.04	0.22	0.0016	0.08	0.04	0.0016 ⁴	2.5
M52-UBF	Apr 16 2019	<0.08	<0.0005	0.0027	0.047	<0.0005	<0.0003	0.0013	<0.0003	0.0014	<0.0031	<0.0005	<0.0003	<0.0001	0.0095	0.0025	<0.0005	<0.04
M54-LBF	Apr 18 2019	<0.04	<0.0005	0.0025	0.053	<0.0003	<0.0003	0.0009	<0.0003	0.0013	<0.0031	<0.0005	<0.0003	<0.0001	0.0047	<0.0025	<0.0005	<0.04
M54-0	Apr 18 2019	<0.04	<0.0005	0.0016	0.0076	<0.0003	<0.0003	0.0022	<0.0003	0.0018	<0.0031	<0.0005	0.0042	<0.0001	0.0041	<0.0025	<0.0005	<0.04
M55-UBF	Apr 24 2019	<0.08	<0.0005	0.0021	0.064	<0.0005	<0.0003	0.0049	<0.0003	0.0019	0.049	0.0009	0.0055	0.0002	0.0056	<0.0025	<0.0005	<0.04
M56-LBF	Apr 18 2019	<0.08	<0.0005	0.0017	0.07	<0.0005	<0.0003	0.001	<0.0003	0.0013	<0.0031	<0.0005	0.0008	<0.0001	0.0053	<0.0025	<0.0005	<0.04
M57-0	Apr 25 2019	<0.04	<0.0005	0.0008	0.0057	<0.0003	<0.0003	0.0053	<0.0003	0.002	<0.0031	<0.0005	0.0003	0.0001	0.0057	<0.0025	<0.0005	<0.04
M58-0	May 01 2019	<0.08	<0.0005	0.0014	0.011	<0.0005	<0.0003	0.004	<0.0003	0.0018	<0.0031	<0.0005	0.0014	<0.0001	0.003	0.0053	<0.0005	<0.04
M59-0	Apr 24 2019	<0.04	<0.0005	0.0019	0.031	<0.0003	<0.0003	0.0037	<0.0003	0.0013	0.026	<0.0005	0.0026	0.0004	0.0052	<0.0025	<0.0005	<0.04
M60-0	Apr 25 2019	<0.08	<0.0005	0.0014	0.047	<0.0005	<0.0003	0.0027	0.0003	0.0065	<0.0031	<0.0005	0.0005	0.0001	0.0095	<0.0025	<0.0005	<0.04
M60-0 (Dup)	Apr 25 2019	<0.08	<0.0005	0.0014	0.048	<0.0005	<0.0003	0.0032	<0.0003	0.0064	<0.0031	<0.0005	0.0005	0.0001	0.0093	<0.0025	<0.0005	<0.04
M61-LBF	Apr 25 2019	<0.08	<0.0005	0.0019	0.077	<0.0005	<0.0003	0.001	<0.0003	0.0008	0.011	<0.0005	0.02	0.0001	0.0005	<0.0025	<0.0005	<0.04
MW-01-LBF	Apr 24 2019	<0.04	<0.0005	0.0016	0.052	<0.0003	<0.0003	0.0056	<0.0003	0.0013	0.0045	<0.0005	0.0008	0.0001	0.0097	<0.0025	<0.0005	<0.04
MW-01-0	May 01 2019	<0.08	<0.0005	0.0012	0.01	<0.0005	<0.0003	0.0055	0.0003	0.0026	<0.0031	<0.0005	0.0013	<0.0001	0.0087	0.0027	<0.0005	<0.04
MW-01-0 (Dup)	May 01 2019	<0.08	<0.0005	0.0011	0.0095	<0.0005	<0.0003	0.0058	0.0003	0.0028	<0.0031	<0.0005	0.0015	<0.0001	0.0097	0.0028	<0.0005	<0.04
Alert Levels		0.16	0.0048	0.026	1.6	0.0032	0.004	0.08	0.002	0.8	0.24 ⁵	0.04	0.04 ⁵	0.0016	0.08 ¹	0.04	0.0016	4. ²
Arizona Aquifer Water Quality Standard		NE	0.006	0.05	2	0.004	0.005	0.1	NE	NE	NE	0.04	NE	0.002	0.1	0.05	0.002	NE

All results in milligrams per liter (mg/L)

< = less than detection limit

NE = Not established

¹Alert Level for Nickel at M60-0 is 0.20

²Alert Level for Zinc in MW-01-LBF is 4.6

³Alert Level for Cadmium in M15-GU and M22-0 is NE

⁴Alert Level for Thallium in M22-0 and M23-UBF is NE

⁵Lowest Alert Level shown

Where APP and UIC Alert Levels differ, the lower UIC Alert Levels are shown

ATTACHMENT 11

Well Bore Annular Electrical Conductivity



ANNULAR CONDUCTIVITY DATA QA PROCEDURE & DOCUMENTATION FORM (V.1)

GENERAL

HGI Project Name: 2018-030 - FCP Bulk & Annular Conductivity Monitoring	Project Site: Florence Copper Project	Weather Conditions: 29 °C, Some Cloud Cover, Sunny
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Date

2 May 2014

Field Operator Name:

L. Salgado

Start and End Time:

1415 - 1530

EQUIPMENT

		DIAGNOSTICS	MEASUREMENT SETTINGS
		(See back of sheet for detailed instructions and procedures)	
AGI MiniSting (MS) Serial #: S0608049		6Ω Resistor Standard Result: 6.430	<ul style="list-style-type: none"> • No. Cycles: 4 • Max Error: Off • Max Current: 50mA • Measure Time: 3.6 • Measure mode: RESISTANCE
HGI Cray Interface Panel SN# CR-ES-002		Pass Criteria: 6.25Ω ± 0.30 Circle One: Pass or Fail	

DATA COLLECTION:

WELL ID	Time (24h)	Current (1 mA)	1			2			3			Data Accept-ance	
			Reading	Resistance (ΔY= Ω)	Error (σ= %)	Reading	Resistance (ΔY= Ω)	Error (σ= %)	Reading	Resistance (ΔY= Ω)	Error (σ= %)		
1	WB-04	1456	90	177	62.25	1.8	178	62.30	2.3	179	62.15	2.4	P/F
2	WB-03	1450	20	174	76.58	1.5	175	76.85	1.8	176	76.82	1.9	P/F
3	WB-02	1507	20	183	75.31	2.8	184	76.14	2.4	185	75.97	2.4	P/F
4	WB-01	1501	20	180	51.92	1.1	181	51.26	2.4	182	50.95	2.5	P/F
5	B-01	1425	20	162	60.30	0.7	163	59.69	1.0	164	59.46	1.1	P/F
6	B-07	1432	20	165	54.12	0.5	166	53.42	0.6	167	53.11	0.7	P/F
7	B-05	1438	20	168	59.53	0.8	169	58.46	0.5	170	57.92	0.6	P/F
8	B-05	1445	20	171	82.02	0.5	172	81.49	0.8	173	81.25	0.9	P/F
9	B-04	1514	20	186	59.46	0.5	187	58.75	1.2	188	58.60	1.4	P/F
10	B-03	1520	20	189	49.15	0.5	190	48.28	0.7	191	47.78	0.7	P/F
11	B-02	1525	20	192	61.50	2.8	193	61.37	3.1	194	61.09	3.2	P/F
12													P/F
13													P/F
14													P/F
15													P/F

DATA QUALITY ACCEPTANCE

FIELD OBSERVATIONS

Measurement Error Evaluation
Pass Criteria: 66% (2/3) of measurement error values less than 5%

(Briefly describe site activities at time of data acquisition, status of electrode arrays, or other parameters that may influence readings)

Technicians checking on wells, water levels

SIGNATURES

By signing, I certify that data collection instrumentation pass all required tests and the data collection procedure follows all required setup and programming instructions listed in the quality assurance procedures.

2 May 2019
Field Operator Signature/Date

By signing, I certify that measured data pass all required data quality tests listed within this procedure.

6 May 2019
Data Inspector Signature/Date